Title  A critical approach to the development of a framework to support the evaluation of information strategies in UK Higher Education Institutions

Name  Youngmei Nie Bentley

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A CRITICAL APPROACH TO THE DEVELOPMENT OF A FRAMEWORK TO SUPPORT THE EVALUATION OF INFORMATION STRATEGIES IN UK HIGHER EDUCATION INSTITUTIONS

by

YONGMEI NIE BENTLEY

A thesis submitted for the degree of Doctor of Philosophy to the University of Luton

March 2005

Yongmei Nie Bentley

Abstract

The objective of this thesis has been to develop a framework to support the evaluation of information strategies of UK higher education institutions (HEIs). For this study the theoretical and empirical literature was extensively reviewed and four substantial pieces of empirical research were conducted. These included action research (AR), two pieces of ethnographic research, and a case study.

The AR analysed problems encountered with a Student Records System at a UK university and identified both immediate and deeper causes for these problems. Ethnography I involved the researcher's participation in the information strategy development process at the same university. This included consideration of the development processes adopted and also the way that decisions were taken. Ethnography II consisted of participant observation at a range of workshops and conferences organised by the Joint Information Systems Committee on information strategy development at UK HEIs. These provided a broad picture of information strategy development procedures being adopted across these HEIs. The case study investigated in detail the implementation of an information strategy at a university different from that examined in AR and Ethnography I.

These empirical investigations all included in-depth interviews. In total 117 people of various levels and backgrounds involved in information strategies and associated information systems within UK HEIs were interviewed.

Key findings from the empirical research were:

(1) Many HEIs in the process of developing an information strategy, or about to do so, were not fully sure how this should be achieved nor the extent of the likely benefits.
Most HEIs implementing information strategies were using top-down directed system approaches, leaving little room for more inclusive bottom-up emergent planning.

Information strategies need to be developed and evaluated using strongly human-centred methods, primarily because it became apparent that the successful functioning of such a strategy is dependent on the motivation and competencies of the people who create and use the information.

Investigations into aspects of information strategy development and implementation need to focus on people's perceptions of the situation rather than seeking an objective truth independent of the participants. This reflects a Kantian perspective of knowledge. Overall, the empirical findings supported the use of a Critical Systems Thinking approach in the evaluation of information strategies at higher education institutions.

The development of the evaluative framework, the main objective of the thesis, took place in two phases: developing the framework based on the literature review and revising the framework from the empirical research investigations involving a process of critical iteration. The first phase identified a range of elements associated with an HEI's information strategy, and for each element highlighted the relevant theoretical and/or empirical literature that bears on the issues being addressed. In particular, the framework is strongly influenced by insights drawn from the work of three key social theorists: Kant, Habermas and Foucault. In addition, the framework includes 'guidelines for evaluation', where these are more practical questions to ask and areas to investigate when evaluating a given element of the strategy.

The second phase took the framework through a series of reflections and revisions based on the findings from the empirical investigations. In each case, insights were gained that related to the use or applicability of the framework.

By combining the findings from the theoretical and empirical literature with those from the empirical research, the final framework, which is believed to have filled a gap in the theoretical literature, aims to encompass the complexity of information strategy development and implementation within HEIs. The framework reflects a human-centred and Critical Systems Thinking approach, and is designed to allow potential evaluators to identify underlying causes for the success or failure of an information strategy that is implemented at an HEI.
Publications and Presentations Based on This Research


1 The conference proceedings on CD do not contain page numbers.


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² The author's maiden name was Yongmei Nie.
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The support and advice of all these people and organisations have been invaluable in the completion of this thesis.
DECLARATION

I declare that this thesis is my own unaided work. It is being submitted for the degree of Doctor of Philosophy at the University of Luton. It has not been submitted before for any degree or examination in any other University.

Name of candidate: Yongmei Nie Bentley

Signature: [Signature]

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PART I

OVERVIEW OF THE THESIS
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INTRODUCTION
CHAPTER 1
INTRODUCTION

1.1 Overview

This thesis focuses on developing a human-centred framework for supporting the evaluation of information strategies\(^1\) at UK higher education institutions (HEIs). The aim of the framework is to help a potential evaluator identify problems and difficulties associated with the implementation of an information strategy, and to suggest ways in which these problems might be remedied. The framework seeks to be human-centred, by helping uncover people's perceptions, motivations and social constraints in the situations under investigation.

The framework functions by identifying specific elements associated with information strategies in HEIs, and for each element directing the user to underlying theoretical literature, empirical evidence and available methodologies to help resolve the problems identified. The framework thus effectively links a broad range of relevant theories with information derived from practical experience. These theories include critical social theory, systems thinking ideas and management theory. The practical experience covers the empirical work carried out by the Joint Information Systems Committee (JISC) of the UK Higher Education Funding Council (HEFC) on information strategy development at UK HEIs; experiences reported by these HEIs; and the researcher's own findings from four empirical investigations – action research, two pieces of ethnographical research and a case study.

\(^1\) For the concept of 'information strategy', see Section 3.2 in Chapter 3.
It is believed that this is the first such framework for information strategy evaluation in HEIs, and it is hoped it can provide a useful analytical tool for HEIs to use.

1.2 Research Background

In recent years, there has been increasing emphasis on the development of information strategies at HEIs. The provision of such strategies is part of the wider strategic planning that is now a core requirement in all UK HEIs, not least because of the requirement placed on them by the HEFC to submit annual strategic plans.

An important driver for these initiatives has been the increasing competition faced by universities in the UK in what has become a global market, combined with increased expectations from society and from the students themselves. As part of the response to these changes, UK universities have been encouraged to adopt information strategies with the aim of providing well-thought-out information approaches to support teaching provision and research.

As early as the 1990s in the UK, JISC was charged with the objective of encouraging and facilitating the development of information strategies within the HE community. To support this process, in 1994 JISC established an Information Strategy Steering Group to investigate the potential for developing such strategies within HEIs (JISC, 1995a). According to JISC (1995a: 2), the research undertaken by the Steering Group highlighted “a genuine interest in the use of information strategies as a means of ensuring value-for-money from technology, exploiting technological advances, coping with increased numbers of students and reduced funds, and attempting to bring about a change in attitudes, especially towards the ownership and accessibility of information within the institution”. Moreover, JISC identified the need for a strategic approach to information management as crucial to the success of HEIs. The eventual outcome of JISC’s research was the

---

1 The investigation for this thesis started in September 1999.
publication of the *Guidelines for Developing an Information Strategy* in 1995. (The short form, *the Guidelines*, is used in the following sections.)

In 1996, JISC selected six HEIs as ‘Pilot Sites’ for applying the *Guidelines*; and in 1998 nine further institutions were selected as ‘exemplar sites’, to represent HEIs at different stages of information strategy development (see Chapter 4 for details). By 1999, fourteen additional institutions, including the University of Luton, were in the process of developing information strategies under the *Guidelines*.

To date, many other UK HEIs either have developed, or are in the process of developing, institution-wide information strategies. However, there has been no formal framework for supporting the evaluation of such strategies. This research addresses this issue.

### 1.3 Philosophical and Theoretical Direction Taken with the Research

This research project is developed within a well-recognized domain. Whilst the roots of this domain are grounded in the so-called ‘hard-soft’ debate that has been prevalent in information systems (IS) from the 1960s onward (see, for example, Checkland and Holwell, 1998), this thesis seeks support from a wider base. Clarke (Clarke, 2004; Lehaney et al. 2004) has sought to provide a philosophical and theoretical rationale for information and knowledge management, and this perspective is used to provide a foundation to the present study.

In Clarke’s work, questions are raised concerning the philosophical basis for IS, an issue directly relevant to this research. In order to find a theoretical basis for IS, many argue that it is necessary to determine whether the domain is ‘hard’ (technological) or a ‘soft’ (human-centered). Clarke (2004) indicates that a clue to this debate can be found in philosophy, which since the time of the Greeks has taken the nature of objective reality as one of its primary problems. This problem was largely resolved by Kant (1724-1804), with the publication of his
“Critique of Pure Reason” (Kant, 1787). Kant’s view, in essence, says that as human beings we access the world around us through our five senses: beyond this we have no access to ‘objective reality’ as such. Prior to Kant, most philosophical ideas accepted that there is such a thing as objective reality to which humans have access: the problem being how it was possible to know this objectivity. Kant’s insight reversed this - we do not have access to objective reality, so whilst it is acceptable to think that there exists a World of ‘real objects’ which give rise to our perceptions, we have no access to them:

“What objects may be in themselves, and apart from all this receptivity of our sensibility, remains completely unknown to us. We know nothing but our mode of perceiving them - a mode which is peculiar to us ... Even if we could bring our intuition to the highest degree of clearness, we should not thereby come any nearer to the constitution of objects in themselves.” (Kant 1787: 82).

Although it is more than two centuries since this was written, it is relevant to the debate about information systems being either a hard or soft domain. Traced to its philosophical roots, it becomes clear that technology is not the hard domain it is generally taken as, but rather it must be interpreted through the particular human viewpoints involved. Technical artefacts (computers, software, data, information systems and so on) should not be seen as having an existence independent of human perceptions; they are part of our perceptual reality. The result is that when investigating a problem with information systems the distinction between hard and soft domains is, in this sense, a false one: both domains need to be studied from the viewpoint of the perceptions and understandings of the people involved, as it is only here that the relevant information on the ‘objective reality’ is held. In essence, the fundamental driver for any problem lies in people’s understanding of the ‘objective reality’, not in the ‘objective reality’ itself. Uncovering the causes of a problem involving humans necessarily means uncovering the perceptions that bring these people to the views that they hold, and hence to the actions that they take. For this reason, in terms of understanding people’s behaviour in complex situations, the views of Kant are seen as the primary root on which modern approaches within critical theory are grounded.
Within this thesis, this Kantian position is taken as central, and the theoretical development of the research is based on this.

1.4 Aims and Objectives of the Research

The overall aim of this research, as mentioned at the beginning of this chapter, is to develop a framework to support the evaluation and critical review of information strategies in HEIs using human-centred methods. The purpose is to increase the success in implementing information strategies within HEIs. To support this aim, the following specific objectives were identified:

(1) To understand how some earlier information strategies in UK HEIs had been generated in practice.

(2) To compare the approaches adopted by these HEIs for strategy development with the existing methods/methodologies as published in the research domain, and draw lessons for future information strategy development.

(3) To explore the context for part of the information strategy development at a specific UK HEI, uncover the main problems associated with this development, identify proximate and deeper causes and suggest feasible solutions for fixing these problems.

(4) To promote the application of critical social theory in understanding the problems related to the management of information in HEIs.

(5) To investigate the decision-making process associated with the above information strategy development.

(6) To offer advice on how the effectiveness of an information strategy can be improved by drawing useful insights from existing social theories and empirical experience.

(7) To provide a useful tool to support evaluation of the information strategies as implemented at HEIs.
1.5 Structure of the Thesis

This thesis consists of four parts – this overview; a literature review and initial framework; the research methodology and empirical investigations; summary and conclusions. Within these four parts, there are ten chapters.

This chapter has given an overview of the thesis, followed by a description of the research background to set this study into context. The philosophical and theoretical direction taken with the research has been described, as well as the main objectives identified for the thesis. The subsequent chapters are as follows:

Chapter 2 first provides a rationale for the choice of literature, and then reviews the literature seen as relevant to this research. This literature covers four broad areas. Firstly, it examines Burrell and Morgan's (1979) framework for the classification of social theories, and then covers in some detail the works of three critical social theorists – Habermas (1972, 1979, 1984), Foucault (1979, 1983), and Kant (1787) - whose contributions to the study of information systems is increasingly recognised as important by researchers. Secondly, the chapter looks at the development of systems thinking, covering the evolving process from 'hard' to 'soft' systems thinking. Thirdly, it turns to critical systems thinking (CST). This includes the development and the theoretical base of CST, challenges to CST, and the future direction of CST. Examples of CST are given to illustrate the potential applications of CST ideas in solving practical problems within organisations. These examples include: Critical Systems Heuristics, Systems of systems Methodologies, and Total Systems Intervention. Finally, the chapter also looks at those elements of information strategy development that are addressed by management theory, including external and internal environment analysis, organisational structure and culture, resource management, competitive advantage, strategic alignment, and the management of strategic change.

Chapter 3 starts with a review of literature on the concepts of strategy and information strategy, the theme of this study. It then focus on reviewing the empirical literature in the area of information strategy development at HEIs, drawing mainly on JISC's work on information strategy development at HEIs. It
also looks at the application of these approaches in practice as experienced by JISC's pilot sites.

Chapter 4 uses the information gained from the theoretical literature reviewed in Chapter 2 and the empirical literature reviewed in Chapter 3 to develop an initial framework for evaluating information strategies at HEIs. This framework is built in four stages each having a particular focus with its various elements. Each element is described in detail under the subtitles of 'theoretical perspective', 'empirical evidence' and 'guideline for evaluation'. The framework is set out in the form of a diagram and an accompanying table.

Chapter 5 outlines the research methodology designed for this research. It starts with an exploration of the nature of the research followed by definitions of the research methods chosen for this study. This leads to the research design of this study, adopted from the model proposed by Maxwell (1996), and relates the research application areas selected to each of the methods proposed. It then describes the approach adopted for data analysis, and the methods used to improve the reliability of the research.

Chapters 6 to 9 describe in detail four pieces of empirical research carried out for this study - a piece of action research, two pieces of ethnographic research (Ethnography I and Ethnography II) and a case study. The action research investigated a Student Records System at a UK university, and generated detailed information relating to a number of the elements within the evaluative framework. Ethnography I was concerned with the researcher's participation in developing an information strategy at the same university, with the intention of understanding the process of such a strategy formulation. Ethnography II was mainly concerned with the researcher's participant observation at workshops and conferences organised by JISC for facilitating information strategy development at UK HEIs. The purpose of this second piece of ethnographic research was to gain a broader view across the UK of the development and implementation of such strategies. The case study investigated the development and implementation of an information strategy at a UK university different from the one where the action research and Ethnography I were carried out. This university was working within
JISC guidelines, and the purpose of the study was to identify success factors of this university’s information strategy as implemented.

Based on the findings from these investigations, a series of critique was carried out, and in each case insights were gained that related to certain elements within the proposed evaluative framework of Chapter 4. Therefore, after each piece of empirical research, a ‘new’ version of the evaluative framework is presented.

Finally, Chapter 10 provides the summary and conclusions of the thesis. It starts with the presentation of the final evaluative framework that reflects the additional insights from the research investigations, followed by an overall summary of the work, key findings from the research, overall conclusions, main contributions and limitations of the research, and suggestions for further research.

The overall layout of the thesis is illustrated in Table 1.1.
Table 1.1 Layout of the Thesis

<table>
<thead>
<tr>
<th>SECTION / CHAPTER</th>
<th>SECTION/CHAPTER TITLE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Part I</strong></td>
<td>Overview of the Thesis</td>
</tr>
<tr>
<td>Chapter 1</td>
<td>Introduction</td>
</tr>
<tr>
<td><strong>Part II</strong></td>
<td>Review of Literature and the Development of an Initial Framework</td>
</tr>
<tr>
<td>Chapter 2</td>
<td>Theoretical literature review</td>
</tr>
<tr>
<td>Chapter 3</td>
<td>Empirical literature review</td>
</tr>
<tr>
<td>Chapter 4</td>
<td>The development of a framework based on relevant theoretical and empirical literature</td>
</tr>
<tr>
<td><strong>Part III</strong></td>
<td>The Research Methodology and the Empirical Investigations</td>
</tr>
<tr>
<td>Chapter 5</td>
<td>Design of the research methodology</td>
</tr>
<tr>
<td>Chapter 6</td>
<td>Action research - Investigating a Student Records System</td>
</tr>
<tr>
<td>Chapter 7</td>
<td>Ethnography I - Participating in the process of an information strategy development</td>
</tr>
<tr>
<td>Chapter 8</td>
<td>Ethnography II – Participant observation at workshops and conferences on information strategy</td>
</tr>
<tr>
<td>Chapter 9</td>
<td>Case study - Investigating the implementation of an information strategy</td>
</tr>
<tr>
<td><strong>Part IV</strong></td>
<td>Summary and Conclusions</td>
</tr>
<tr>
<td>Chapter 10</td>
<td>Summary, conclusions and further research</td>
</tr>
</tbody>
</table>
PART II

REVIEW OF LITERATURE AND THE DEVELOPMENT OF AN INITIAL FRAMEWORK
CHAPTER 2

THEORETICAL LITERATURE REVIEW
2.1 Introduction

In this thesis, the literature review is covered in two chapters. This chapter presents a review of the relevant theoretical literature, while empirical literature is covered in Chapter 3.

The main contents of this chapter are illustrated below in Figure 2.1.

The chapter opens with a rationale for the choice of literature for this study in Section 2.2, which starts with the key concepts of information and systems. This helps set an overall focus as to how an organisation's information strategy might be developed. The chapter then looks at the social theory and Critical Social
Theory\(^1\) seen as underpinning this study in Section 2.3. The general classification of social theories promoted by Burrell and Morgan (1979) was used to set the various theories into context. It then looks at works of two influential critical social theorists - Habermas (1972, 1979, 1984), Foucault (1979, 1983) as well as at the ideas of the philosopher Kant (1787), on which the critical social theories of Habermas and Foucault were partly grounded.

The need for a critical systems approach to information management becomes clear in the discussion of 'Systems Thinking' in Section 2.4, which shows that functionalist approaches to developing information systems often failed due to the ignorance of the human element, and where, as a result, Soft Systems Thinking (SST) approaches were introduced. The latter took account of participants' perceptions of the problem situation, but in turn often failed to deal with the issues of power and coercion. Therefore the discussion moves in Section 2.5 to the topic of Critical Systems Thinking (CST) which has been developed to handle such issues, and which serves as a basis for the research presented here. This section also points to the theoretical grounding of this research in critical social theory.

Section 2.6 discusses well-established organisation and management theories which cover a number of aspects of the development process of an information strategy. These include aspects such as an organisation’s external and internal environments, its resource management, and the management of change. Section 2.7 gives a summary and conclusions of the chapter.

2.2 Rationale for the Choice of Literature

The literature selected for review was centred on topics and works of authors important to the understanding of information systems and information processes, and in particular on literature dealing with the extent that people’s social settings and degrees of knowledge direct their actions. In addition, organization and management theories were also reviewed, as will be seen later,

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\(^1\) According to Habermas (1984), critical social theory is a unique framework that clarifies conditions, means, contents, constraints and objectives of all socially organized human behaviour.
the information drawn from this review informed the development of the initial evaluative framework in Chapter 4.

2.2.1 Interpretation of the Concept of Information

The idea of ‘information’ is often associated with the concept of ‘data’. However, data and information are different. While “data represent unstructured facts, information has a meaning and use to a particular recipient in a particular context” (Avison and Fitzgerald, 1995: 12). This introduces the idea that data have meaning via context, but one set of data may lead to different viewpoints for different users. A more constructive definition can be found in a Concise Oxford Dictionary, which defines information as ‘Informing, telling, ... items of knowledge’. Information, in this sense, is essentially a human property. Informing, telling and knowledge are not simple facets of the data itself, but reflect cognitive processes and social interaction. As will become clear, this research views information as something which is used by, and passes between, individuals and groups in a given social environment, and where the information’s meaning and utility is determined by the individual or group perceptions at that point in time. These perceptions, in turn, are influenced by the social forces that exist between the individuals and groups involved with the information. For this reason, the theoretical literature reviewed has not been simply technical, but has included theories of social systems.

2.2.2 Realisation of the Complexity of the Concept of ‘System’

A ‘system’ is usually defined as a set of elements (often complex) combined with the interactions between these elements. Avison and Fitzgerald (1995) broaden this definition, stating that a system represents a way of thinking about the set of interacting components. Flood and Jackson (1991a: 2) go further still, and define a system as “a particular way of organising our thoughts about the world”. While the narrow definition correctly captures what a system ‘really is’, the two wider definitions help remind people of the Kantian view that to
understand a system it is important to understand our thoughts and perceptions about the system.

For the topic considered here the system includes the people involved (managers, analysts, data providers and system users), the objects used (including IT, computer hardware and software), and the procedures employed (from data entry rules to specific information systems development methodologies) that together make up the totality of how the information under consideration is generated and handled. This view embodies the concept of holism. "Being 'holistic', in the managerial domain, means using systems ideas and concepts to understand and intervene in problem situations" (Jackson, 2003: 301). One of the most important of systems ideas is that the whole system is greater than the sum of its parts. The system idea in Kant refers to the totality of elements – ethical, political, ideological and metaphysical – on which theoretical or practical judgements depend. Ulrich (1983) uses the systems notion as a tool of critical reflection. System, in this sense, is not seen as something to be controlled instrumentally within a given set of parameters, but which must be viewed holistically (Clarke, 2001a).

The history of developing methodologies for the construction of information systems has, in part, been in trying to come to terms with what is the 'system' being examined. Is the system just data and technology, and people are only passive recipients of the information? Or do the people in the system have perceptions that need to be considered; or perceptions that need to be changed? Or are the people in the system a complex social group, with a variety of 'mental histories' and viewpoints that control the way that the information itself is generated, distributed and acted upon? These questions are fundamental and have helped determine the choice of literature that has been reviewed.

2.2.3 Identification of the Theoretical Basis

As mentioned above, systems thinking, which is seen as fundamental to the understanding of human social and cognitive activities, requires an understanding of theories of social systems. This literature review uses Burrell and Morgan's (1979) paradigms for analysing social theory to provide a tool for
identifying the basic characteristics of social theories, and to help place these theories into context.

Critical Social Theory has been applied extensively in information management (Hirschheim 1986; Hirschheim and Klein 1989; Lyytinen and Hirschheim 1989; Clarke and Lehaney 2002). It therefore offered potential as a way forward for this study. The literature review looked at the works of two influential critical social theorists Habermas (1972; 1976) and Foucault (1983), as well as the work of Kant (1787) on which Habermas and Foucault partly based their works. The work of Habermas (1972) is concerned with truth and rationality, and maintains that humans seek to achieve three interests - technical, practical, and emancipatory. Foucault (1983) sees power as necessary for the production of truth, explaining that power is not possessed, but exercised; and that power and discourses work to constrain people. Kant (1787) inquired into the limits of knowledge, and raised the question 'what can be known', asking to what extent humans can have access to a truth external to their own senses and thought processes. As can be seen in the later sections of this chapter, these works helped direct the line of reasoning towards Critical Systems Thinking, which itself has been embedded in the empirical investigations of this study.

In essence, the philosophical and theoretical perspective on which this study is grounded sees the world as socially constructed, and argues that human issues can only be understood from a socially constructed viewpoint.

2.2.4 Understanding of Organisation and Management Theories

To understand how people perceive, use and react to information, we need to understand how they behave in various social settings within organisations, and how organisations themselves behave. There is an extensive literature on these issues, and the literature review covered theories of organisational culture and structure, environment analysis, resource management, competitive advantage, strategic alignment, and management of strategic change.

Having set out a rationale for the literature reviewed, the remainder of this chapter presents the review in detail.
2.3 Relevant Social Theory and Critical Social Theory

2.3.1 Sociological Paradigms

This section of the review starts by addressing Burrell and Morgan's (1979) framework for the classification of sociological paradigms. This framework provides a general tool for identifying the basic characteristics of social theories, and is used here to help reflect on various theoretical assumptions about organisations, and the human nature itself.

A. *The Four Paradigms for the Analysis of Social Theory*

Burrell and Morgan suggested that assumptions about the nature of *social science* could be seen as either subjective or objective in character; and that assumptions about the nature of *society* could be seen as emphasizing either regulation, or radical change. They therefore proposed that all social theories could be positioned within the context of four general paradigms: functionalist, interpretivist, radical humanist and radical structuralist, according to the general assumptions that these theories reflect (Figure 2.2).

The Sociology of Radical Change

<table>
<thead>
<tr>
<th>Subjective</th>
<th>Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interpretative</td>
<td>Functionalist</td>
</tr>
<tr>
<td>Radical Humanist</td>
<td>Radical Structuralist</td>
</tr>
</tbody>
</table>

*Figure 2.2 Four Paradigms for the Analysis of Social Theory*  
*Burrell and Morgan, 1979: 22*
The functionalist paradigm represents a ‘worldview’ which is rooted in the sociology of regulation, and which approaches its subject matter from an objectivist point of view. It is often problem-orientated in approach, and concerned with providing “practical solutions to practical problems” (Burrell and Morgan, 1979: 26). This reflects the attempt to understand the world via the effective ‘regulation’ and control of social affairs, and to “apply the models and methods of the natural sciences to the study of human affairs” (Burrell and Morgan, 1979: 26). The approach tends to assume that ‘the social world is composed of relatively concrete empirical artefacts and relationships which can be identified, studied and measured through approaches derived from the natural sciences’ (Burrell and Morgan 1979).

The interpretative paradigm is also regulative, but is informed by a concern “to understand the fundamental nature of the social world at the level of subjective experience” (Burrell and Morgan, 1979: 28). This paradigm pays attention to how people interpret the world, and sees the social world as an emergent social process which is created by the individuals concerned, and seeks explanation within the realm of individual consciousness and subjectivity. Interpretive social theories are, therefore, concerned with understanding the essence of the everyday world; and the interpretive sociologists are orientated towards “obtaining an understanding of the subjectively created social world ‘as it is’ in terms of an ongoing process” (Burrell and Morgan, 1979: 29).

According to the above authors, the foundations of the interpretive paradigm were laid in the work of Kant, and reflect a social philosophy which emphasises the essentially spiritual nature of the social world. The premises of the interpretive paradigm question whether organisations exist in any form but people’s perceptions of them. Therefore, its significance for the study of organisations is fundamental. It challenges the validity of the ontological assumptions which underpin functionalist approaches to sociology in general, and the study of organisations in particular.

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2 Ontology concerns the nature of reality. It is a theory of what the world is, or contains (Checkland, 1995). The two opposing extremes of thought are realism - reality is external to the individual, and nominalism - reality is a product of individual consciousness, a product of one’s own mind (Flood, 1990). For the realist, the social world exists independently of an individual’s appreciation of it.

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The radical humanist paradigm is concerned with the development of the 'sociology of radical change' from a subjectivist point of view. Its approach has much in common with that of interpretative paradigm, in that it views the social world from a perspective which tends to be nominalist and anti-positivist (Burrell and Morgan, 1979) and believes that knowledge is 'soft', subjective, based on experience and insight, and essentially of a personal nature (Clarke, 1997). However, unlike interpretivism\(^3\), it emphasises the importance of overthrowing or transcending the limitations of existing social arrangements. Radical humanism aims to help humans achieve their true potential. It focuses on the achievement of radical change, modes of domination, emancipation, deprivation and potentiality'. In keeping with its subjectivist approach to social science, this perspective places central emphasis upon releasing humans from 'false consciousness': “the consciousness of man is dominated by the ideological superstructures with which he interacts, and these drive a cognitive wedge between himself and his true consciousness” (Burrell and Morgan, 1979: 33). This, in turn, is seen as 'preventing true human fulfilment'. The authors further explain that the intellectual foundation of the radical humanist paradigm can be traced to the same source as that of the interpretive paradigm, i.e. “the German idealist tradition, particularly as expressed in the work of Kant and Hegel” (Burrell and Morgan, 1979: 33), but explain that 'it was through Marx that the idealist tradition was first utilised as a basis for radical social philosophy, and that many radical humanists have derived their inspiration from this source'.

The last of the four paradigms is the radical structuralist. This paradigm shares an approach to science with that of functionalist theory, but is directed at fundamentally different ends. It advocates sociology of radical change through structural conflict. Radical structuralism is committed to radical change, emancipation and potentiality, but unlike the radical humanist paradigm, here the concepts are characterised by objectivist views of the social world. Burrell and Morgan (1979) note that ‘whereas the radical humanists forge their perspective

\(^3\) Interpretivism is an epistemological position that requires the social scientists to grasp the subjective meaning of social action, a view, according to Flood (1990), that recognises the innate subjectivity of human thought and reason. Understanding cannot arise [only] from observation (and theory) since the human actor will have reason, or intentions, that lie behind each action.
by focusing upon consciousness as the basis for a radical critique of society, the radical structuralists concentrate upon structural relationships within a realist social world'. Their emphasis is on the view that 'radical change is built into the very nature and structure of contemporary society'. Radical structuralists 'seek to provide explanations of the basic interrelationships within the context of total social formations'. Burrell and Morgan (1979) further note that there is a wide debate within the paradigm, and different theorists stress the role of different social forces as a means of explaining social change. However, one view that is common to all is that contemporary society is characterised by fundamental conflicts which generate radical change through political and economic crises. They stress that it is through such conflict and change that the emancipation of people from the social structures in which they live is seen as coming about. The authors note that this paradigm 'owes its major intellectual debt to the work of the mature Marx', being the paradigm to which Marx turned after a decade of active political involvement, and as a result of his increasing interest in political economy.

**B. Comments on the Four Paradigms**

The functionalist paradigm represents a concern with both the social order and the external reality with its goal to analyse organisations and find regularities to facilitate control by using functionalist methods. The interpretive paradigm, while also focusing on order and how order is maintained, views organisations as being the products of the people involved. Therefore, understanding of people’s perceptions and meanings is important. The radical humanist, like the interpretive paradigm, is concerned with the interpretation of the perceptions and meanings of the people involved, but it also sees organisations as arenas of domination and conflict within their wider social context. So the goal of this paradigm is to free people from any ‘false consciousness’ and thus to achieve their potential. This paradigm supports radical change and emancipation through political action to address conflict and domination. Finally, the radical structural approach also looks to change the social order, but sees the constraints to be overcome as objective structural relationships.
Burrell and Morgan (1979: 25) stress that “the four paradigms are mutually exclusive. They offer alternative views of social reality, and to understand the nature of all four is to understand four different views of society”. The authors further state that “one cannot operate in more than one paradigm at any given point in time, since in accepting the assumptions of one, we defy the assumptions of all the others” (Burrell and Morgan, 1979: 25).

Burrell and Morgan’s framework was constituted “in order to relate work in the field of organisational analysis to a wider sociological context” (Jackson, 2000: 22). It enables a structured critique to be made of the different assumptions social scientists make about the nature of social science, and about the nature of society (Jackson, 2000). This critique in turn provides a useful approach to the general question of which theoretical approaches are most suited to the problem contexts faced in the development of information systems.

Burrell and Morgan’s emphasis on the separateness of the four paradigms has also led to criticism. As more and more researchers and practitioners find that no one paradigm can capture the richness of real-world situations, “the acceptance of paradigm isolation” has began to “break down” and “the debate has turned to various forms of pluralism, in both methodological and philosophical terms” (Mingers, 1997a: 3). For example, Gioia and Pitre (1990) argue that paradigms are relatively defined, and that there are ‘transition zones’ between paradigms. Thus, different paradigms can be connected by building conceptual bridges across transition zones. The latter authors imply that a pluralistic, multiple-perspective view is more reasonable. Reef (1992) supports this view, arguing that “selected theoretical elements of different general approaches can be recombined and reworked in such a way that richer and deeper understanding of organisations is made possible” (Reef, 1992: 266). So it seems that Burrell and Morgan have overstated ‘paradigm isolation’ and that methodological and theoretical pluralism may be a more fruitful way forward.

The next three sub-sections (sections 2.3.2 to 2.3.4) of this chapter look at critical social theory represented by three principal contributors - Habermas,
Foucault and Kant whose works have been identified by many researchers as the foundation of Critical Systems Thinking, which itself underpins this study.

2.3.2 Habermasian Cognitive Interests and Ideal Speech Situation

A. Overview

Critical social theory is a theory of social behaviour that defines itself in contrast to other social theories (Klein and Huynh, 2004). The concept of critical social theory is often associated with Habermas (MaCarthy, 1978). Midgley (1995b) supports this, implying that critical approaches to validating work in the domain of management are essentially derived from theory originally proposed by Habermas in his work Knowledge and Human Interests (Habermas, 1972). Earlier recognition of the relevance of the work of Habermas to organisational studies is to be found in the critical systems literature of Mingers (1980) and Jackson (1982). Mingers (1980), for example, explicitly brought in the critical theory of Habermas and compared Critical Systems Thinking (CST) with Soft Systems Methodology. However, according to Mingers (1997a), Jackson (1985b) is seen as ‘the first to explicitly articulate the need for critical methodologies, basing his claims on Habermas’ (1972) version of critical social theory’

For this study, concentration is on those ideas from Habermas’ critical social theory that have received the most attention in information systems research, and these can be found in Knowledge and Human Interests (Habermas, 1972), and Communication and the Evolution of Society (Habermas, 1979). These ideas are discussed below.

B. Three Interests and Comments

Habermas’ critical social theory is concerned with such issues as social inclusion, participation, and a view of how we ought to undertake intervention in social domains. In Knowledge and Human Interests (1972), Habermas critically examines linkages between the analysis of social action at the societal level and major philosophical approaches to reflecting on the nature of social action in
society (Klein, et al. 2004). The main idea in his book is that all human beings seek to achieve three fundamental cognitive interests - technical, practical and emancipatory. These interests are the general orientations that guide how people acquire and use knowledge to pursue their interests in all walks of life, including their occupations (work). Habermas insists that “orientations toward technical control, toward mutual understanding in the conduct of life and toward emancipation from seemingly ‘natural’ constraints establish the specific viewpoints from which we can apprehend reality in any way whatsoever” (Habermas, 1972: 31).

Table 2.1 Summary of the Main Distinctions of Knowledge Constitutive Interests
(Adapted from Habermas, 1972; Oliga 1991; Clarke 2001a; Klein, et al. 2004)

<table>
<thead>
<tr>
<th>Cognitive Interest</th>
<th>Applicable Domain</th>
<th>Purpose</th>
<th>Underlying Paradigm</th>
<th>Inquiring Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical</td>
<td>Labour (work)</td>
<td>Prediction and Control</td>
<td>Functionalist</td>
<td>Empirical analytical</td>
</tr>
<tr>
<td>Practical</td>
<td>Interaction</td>
<td>Achieving mutual understanding</td>
<td>Interpretive</td>
<td>Historical hermeneutic</td>
</tr>
<tr>
<td>Emancipatory</td>
<td>Authority /Power</td>
<td>Agreement by ‘power of reason’</td>
<td>Radical /Critical</td>
<td>Critique of ideology and discourse, assumption analysis</td>
</tr>
</tbody>
</table>

The fundamental differences among the three interests are summarised in Table 2.1. Habermas (1972) implies that these interests are respectively identified in ‘labour’, ‘interaction’ and ‘authority/power’, and these in turn direct people’s endeavours to acquire corresponding types of knowledge using three types of approaches, termed ‘empirical analytical’, ‘historical hermeneutic’, and ‘critical’. Based on these, Flood and Jackson (1991b) suggest that ‘hard’ and cybernetic systems approaches can support the technical interest, ‘soft’ methodologies the practical interest, and Critical Systems Heuristics can aid the emancipatory interest.

So it seems that empirical analytical approaches, served by natural sciences, are seen as satisfying the technical interest. However, this interest is
concerned with predicting and controlling our natural and social environment, which applies to both people and physical objects in the domain of labour. Since such approaches to information systems development and implementation have their roots only in the natural sciences, they appeared, from a Habermasian perspective, to be an insufficient basis for social development. There is also the practical interest which is concerned with pursuing mutual understanding, which applies only to humans as social communication partners. What was needed, therefore, was for social sciences (historical hermeneutic) to service this practical (human interaction) interest. These sciences seek to access meaning, and aim at maintaining and improving mutual understanding among human beings (Jackson, 2000). The third, ‘critical’, sciences which correspond to the emancipatory interest, having recognised the limitations of the other two types of knowledge, attempts to combine and go beyond them, so as to enable people to reflect on their social situation, and to deal with issues of power and coercion. This emancipatory interest is concerned with freeing ourselves from constraints imposed by power relations, which often appear as ‘seemingly natural constraints’ (Habermas, 1972: 31) when in fact they are the result of social forms of domination.

The three cognitive interests determine in turn the cognitive orientations that guide systematic inquiry, as outlined in Table 2.1. Some simple examples may help to clarify the types of orientations, and hence inquiring methods that might be involved.

An employee in an office may know the filing procedure for a particular piece of information; or, if in a factory, how to assemble a particular component. Such information is ‘technical’, and may usually (though certainly not always) be capable of discovery to an investigator by a simple empirical-analytic procedure – for example, by asking a question, or looking in a manual. Moving to the ‘practical’ interest, the same employee may complain that he/she does not get sufficient backup from colleagues when a particular situation arises. Uncovering the trouble here is more difficult. The investigator would need to find out what degree of support the employee considers reasonable (what ‘ought’ to be), and also find out from colleagues what support they see themselves as offering, and why. Discovering these facts may not come from simple questions, but need quite
sophisticated social methods and analysis to discover what factors are really in play. Turning to the ‘emancipatory’ interest, the employee may be having problems with the boss. The situation here is more complex still. Not only is the need to uncover why the individuals are thinking and acting the way they are likely to be difficult itself (people are often very reluctant to discuss such situations, and indeed often do not really know themselves why they feel or act as they do), but there is also a need to raise the issues of power. Ought the power structure be changed, and if so, how? The inquiring (and intervening) method here may be by reason and discourse, by challenging assumptions, or even by encouraging radical action by one or other party.

The overall implication is that Habermas’ different sorts of knowledge need to be inquired into by different means. But we also need to recognise that these types of knowledge often overlap, giving unavoidable uncertainty about which types of investigation methods are best for any particular situation.

Incidentally, Midgley (1995b: 64) identified an interesting problem with Habermas’ treatment of the technical interest. The author says that “by suggesting that human beings have an interest in ‘predicting and controlling’ the natural and social world, Habermas risks perpetuating the myth of the human domination of nature”. He continues that this myth leads people to regard natural phenomena as ‘resources’ for control and consumption, with often unpredictable side effects. So it would be preferable to talk in terms of human beings having an interest in building and preserving a sustainable, interactive relationship with their non-human environment (Eckersley, 1992; Midgley, 1995b).

C. Ideal Speech Situation and Comments

Another particular contribution of Habermas has been his conceptualisation of the ‘ideal speech situation’ (Habermas, 1979), in which communication is undistorted, and rational consensus is the outcome. Habermas (1979) argues that critique is a dialogue process emerging from the inherent potential of language to allow us to question. However, dialogue may be distorted through the effects of power either directly, when one participant coerces another,
or indirectly, when participants make unquestioned assumptions about the absolute necessity for, or inevitable future existence of, particular social systems. To overcome these effects of power, Habermas suggests we use ‘ideal speech situation’ – a situation where any assumption can be questioned and all viewpoints can be heard.

Habermas (1979) insists that the conditions for ideal speech are implicit in all speech, and are assumed in all communicative action. These conditions are:

(a) What is said is capable of being understood, and of mutual understanding, to the concerned parties.

(b) What is said is ‘true’. To be true, a proposition need not address some external ‘objective’ truth, but must be defensible and warranted through reason, where reason is established through discourse.

(c) The speaker is justified in speaking, and has the normative authority to say what is said. (This is a key aspect of Habermas: power is a major determinant here.)

(d) The speaker is sincere in their contributions to the discussion, and genuine in seeking a rational consensus.

Where all the criteria are met, and a proposition is judged meaningful, true, appropriate and sincere, undistorted communication is said to have occurred in an ideal speech situation. The idealisation of communication offers insights into what is happening, and needs to be considered, in real human interaction.

However, Habermas is criticised for being utopian. For example, Ulrich (1983) implies that for all viewpoints to be heard, the ‘ideal speech situation’ would have to extend debate to all in the world. Foucault (1983) also raised a similar objection to the ‘utopian nature’ of Habermas' theory of communicative action, positing as it does a state of communication where truth could circulate freely, without obstacles, without constraint and without coercive effects. For Foucault (see below) this is too big an abstraction from what is really going on in terms of power relations and the possibilities of concrete freedom within them in communicative games. Foucault conjectured that Habermas might have made the assumption (incorrect to Foucault) that power is bad in itself and one must free oneself from it.
Despite the argument over Habermas’ views, their importance, and the fact that they helped identify the need to examine issues of power/authority/control (‘emancipation’) when analysing systems solutions to organisational problems, is widely recognised. Habermas’ three human interests, and his warnings about the dominance of instrumental reason, have informed reflection on the role of the systems methodologies in addressing human interests. Moreover Habermas’ critical social theory and its implications have helped researchers in the domain of information systems (IS) identify that study of IS and its development is fundamentally a social phenomenon.

Habermas’ critical social theory has been one of the primary sources of inspiration for the present study. However attention should be paid to the comments above to avoid being misled by ‘utopian’ ideas in communicative action. For this Foucault’s critical social theory, discussed next, is of help.

2.3.3 Foucault’s Ideas on Power and Knowledge

A. Overview

Unlike Habermas, Foucault, was less concerned with truth or rationality as such, and more interested in the rules which enabled these claims to be made. Foucault developed different approaches over the course of his studies. His earlier work focussed on the ways in which state power and ‘discourses’ worked to constrain people, and noted how social order is maintained as people learn to keep checks on themselves. In his later work the idea of power as a ‘thing’ is analysed, and is seen as a more of a fluid relation, a ‘technique’ which can be deployed. In his unfinished book, *The History of Sexuality* (1978), Foucault suggests power is not a fixed property, held by certain groups, but is fluid and present in all interactions. Where power is exercised, resistance develops, which he sees as a productive relationship.

Foucault based his views on studies of hospitals, doctors’ surgeries, prisons and courts, schoolrooms and welfare offices; places he felt that constructed, structured and maintained ‘normalcy’. From this, he sought to
understand the different modes by which humans are made ‘subjects’ (in the sense of ‘subjection’), and how what is taken as normality is achieved and maintained.

B. Power / Knowledge

Foucault’s principal contribution in critical social theory was “recasting the concept of power, and linking power inextricably with knowledge” (Willcocks, 2004: 264). In Foucault’s analysis (1983), truth is not established by rational consensus under ideal conditions, but is always already infused with power. Far from a ‘contamination’ to be excluded in favour of reason as suggested by Habermas, power is seen as integral to the production of truth. Foucault (1983) argued that in our society, a conflation of knowledge and power produce discourses that establish and maintain truth and normalcy, whilst at the same time these discourses set the rules for the legitimation of knowledge and the exercise of power.

Foucault (1983) explained that power is not possessed, but exercised, and that power needs to be analysed as moving from the bottom up, as not primarily coercive but productive, in that it produces reality, domains of objects, and rituals of truth (Foucault, 1979). He further explained that power must be analysed as something that circulates, and functions only when it is part of a chain; that is exercised through networks, and that individuals are in a position to both submit to and exercise this power. Power passes through individuals (Foucault, 2003).

According to this conceptualisation, power relations permeate and constitute the social body. With power relations rooted in the system of social networks, there is little room for the assumption of authentic human interests or self outside power relationships.

However, Foucault has also been criticised. Firstly, he is seen as overemphasising the concept of power. In his view, all social and cultural phenomena become reducible to power relations. Secondly, (unlike Habermas), Foucault did not develop a methodology for differentiating different forms of knowledge and power. For example, he did not show how acceptable and unacceptable forms of power can be distinguished, nor why constraints should be changed, etc.
Thus, in this study, it is suggested that the implications from Habermas’ three constitutive interests (i.e. using different theories and different research methodologies to address different types of knowledge) be used in combination with methods that uncover issues of power.

2.3.4 Kantian Critical Philosophy

As previously mentioned, this study is underpinned by critical social theory, which sees the world as socially constructed, and argues that human issues are best seen from a socially constructed viewpoint. An underpinning of critical social theory is Kant’s famous work ‘Critique of Pure Reason’ (1787) which inquires into the limits of knowledge. According to Kant, the ultimate nature of reality remains forever inaccessible to the human mind. What we know are phenomena. The mind impresses its forms of sensibility (space and time) on the original data of the senses, and orders them according to categories of thought (causality, substance, and so on.). Kant formally raised the question, ‘what can be known’, asking to what extent humans can have access to a truth external to their own thought processes.

All modern systems thinking has to deal, explicitly or implicitly; with this fundamental question. This is because the operation and success of any system is based, ultimately, on people’s perceptions of that system. This question itself leads to the need to understand and interpret social reality.

According to Clarke (2004), prior to Kant, most philosophers took objective reality as a ‘given’, and sought to explain how it was that we could have knowledge of this reality. This shows the pre-Kantian debate of reason versus experience as the source of our knowledge. The rationalist view was that, by reason alone, we are able to formulate universally valid truths; empiricists, by contrast, saw experience as the only valid source of knowledge.

Clarke (2004) sees Kant’s insight and unique contribution as being to bring together rationalism and empiricism in his (Kant’s) new critical transcendental philosophy. Loosely stated, this says that objective reality may be taken as existing, but that, as human beings, we have access to this only through our senses: we therefore see this objectivity not as it is, but as we subjectively
Kant does not claim that objects exist only in our subjective constructions, merely that this is the only way in which we can know them: objects necessarily conform to our mode of cognition.

### 2.3.5 Critical Social Theory and its Relevance to this Research

In this study we wish to examine how higher education institutions make an information strategy work; for example, why a Student Records System is failing and what is needed to make it function properly; or, as another instance, what are the factors that govern success or failure of committee's decisions on the strategy implementation process.

The works of Habermas, Foucault, and Kant help pursue the line of reasoning towards Critical Systems Thinking which forms a basis for this study. The basic ideas of these three critical social theorists and the implications for this research are as follows.

The perspective of Habermas (1972) is concerned with truth and rationality. In Habermas' view, people have three cognitive interests - technical, practical, emancipatory. Any research into how people behave in the above situations must therefore enquire into these three types of knowledge. As explained earlier, these types of knowledge are very different, and the approaches related to uncover what people think, and how they act, in these areas are also very different. The implication of Habermas' three interests is that the methods employed for such investigations must be pluralist in their social-theoretic viewpoints (as different theoretical assumptions underpin different types of Habermas' interests), and likely also pluralist in the actual research methodologies used.

Foucault (1983) is interested in the rules, and sees power as necessary for the production of truth. In Foucault's view, power is not possessed, but exercised, and power and discourses work to constrain people. In looking at prisons, hospitals, schools, etc. Foucault found that truth was determined by the people in power. Whereas Habermas had talked of the 'ideal speech situation', where a complete and clear description of the situation by all players would lead to a full
understanding of what was going on. Foucault disagreed, saying that the 'ideal speech situation' is a fiction, those with power set the truth. So emancipation to Foucault means revolution, a real removal of power from the powerful. While some researchers have suggested that Foucault sought to explain too much via the concept of 'power', it is from Foucault that we understand the need in this research to examine who has the power, and be aware that it can be power, rather than an 'objective reality' as agreed by all players, that determines truth. An aim of the research described later is to keep an awareness of who really is powerful and who are the powerless, and find ways to listen to the latter. (Note that it is not always the senior managers who are the most powerful, it may be middle managers, or an organized group of workers (such as a trade union), or just an entrenched group of ill-motivated staff.)

By contrast, Kant (1787) inquired into the limits of knowledge, and raises the question 'what can be known', asking to what extent humans can have access to a truth external to their own thought processes. In Kant's view, people can only know the world through their five senses, and from their own internal mental reflections on what their senses tell them. The implication of this view for the research of this thesis is that if we are to deal with a real-world problem situation, it is no good trying to find out what 'is' true; we must access this reality through people's perceptions and thoughts about the reality. Therefore, the approaches for the empirical research of this study must be based on human-centered methods to uncover the knowledge, motivations, and social settings of those involved in the situations being studied. As Kant made clear, we can only get at the truth via people's perceptions.

Table 2.2 summarizes the main implications of these three critical social theories for the research of this study.
Table 2.2 Critical Social Theories and their Implications for this Research

<table>
<thead>
<tr>
<th>THEORISTS</th>
<th>MAIN IDEAS</th>
<th>IMPLICATIONS FOR THIS RESEARCH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Habermas</td>
<td>People understand the world through different types of knowledge (i.e. three cognitive interests).</td>
<td>We must use different theories and different methodologies to inform these different types of knowledge.</td>
</tr>
<tr>
<td>Foucault</td>
<td>Power is necessary for the production of truth.</td>
<td>We must attempt to use research methods that uncover power and its impact on people's knowledge, e.g. who has the power; how it is used ('ought' not 'is').</td>
</tr>
<tr>
<td>Kant</td>
<td>'Objective reality' can be understood through people's perceptions (and through their thinking processes).</td>
<td>To solve real-world problems, we need to know what is true. This can be achieved through people's perceptions about the reality. Thus, to understand problems to do with people, we need use research approaches that aim to uncover people's perceptions.</td>
</tr>
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</table>

All of the above ideas together formed part of the underpinning for the type of systems thinking known as Critical Systems Thinking (CST), which is discussed later in this chapter. But before we come to this, we need to look first at the development of systems thinking. The next section starts with 'hard' and 'soft' systems thinking to highlight the necessity to understand human problems within information management, and to set the historical background for the subsequent development of CST.

2.4 Systems Thinking - from 'Hard' to 'Soft'

2.4.1 Introduction

Senge (1990) defines systems thinking as a discipline for seeing the 'structures' that underlie complex situations. It is a way of thinking that tries to make sense of the 'whole', rather than of each of the parts of a situation. Fundamentally, systems thinking requires an adequate understanding of the discrete elements of a system, combined with an understanding of the behaviour of the interacting links between these elements, so as to understand the behaviour
of the whole. It is clear that we need systems thinking to cope with the increasing complexity of the world around us.

There have been many different ways to think about how systems behave. Historically, most empirical information systems research and system development has been underpinned by a positivist philosophy, and this type of approach is normally named the functionalist or 'hard' systems approach. This tendency has been demonstrated in a number of surveys of the literature (Orlikowski and Baroudi, 1991; Walsham, 1995; Mingers, 2003) and in more theoretical contributions (Benbasat and Weber, 1996; Hirschheim, Klein and Huynh, 1996; Goles and Hirschheim, 2000). Generally speaking, research in this tradition aims to get rid of subjective elements by focusing only on events that can be recorded and measured, and using statistical and mathematical models to capture the rules and patterns that appear in the data.

Subsequently, a number of streams of research based on different philosophies emerged. The main one was interpretivism or soft systems approach, which "emphasizes the inherent meaningfulness of the social world" (Mingers, 2004: 372). This type of research focuses on individual and group subjectivity, aiming to create a rich understanding and description of particular people's experiences of the social world.

The history of systems thinking, that covered the change from functionalist to interpretivist approaches to information systems development, dominated systems theory for over a quarter of the last century (from the 1950s to the 1980s). These approaches, the reasons for the change, and their relevance to information management are elaborated in the sections below.

2.4.2 Hard Systems Thinking and its Relevance to this Research

A. Overview of HST

Hard systems thinking (HST) emerged as a particular notion of a systems approach in the 1950s and 1960s (Checkland and Scholes, 1990). It underlies and informs operational research, systems analysis and systems engineering.
According to Checkland and Scholes (1990: 307), HST "assumes that what 'the system' is is not problematical, that the system's objectives can be defined, and that alternative means of achieving them can be modelled and compared using some declared criteria, enabling a suitable selection to be made of the most desirable form of the system. This can then be implemented and monitored". In other words, HST is a 'means-ends' scheme which assumes that problems can be perceived as a search for an efficient means of achieving declared objectives or meeting declared needs (Checkland, 1985).

Hard systems approaches were developed from traditional scientific roots. Hard systems thinkers conceptualise organisations as goal-seeking machines, and information systems are there to enable the information needs associated with organisational goals to be met.

Jackson (1985a) comments that hard systems approaches may work well in dealing with the engineering-type problems for which they were originally designed. They have proved useful for well-structured problem situations with clear objectives, as they allow the use of powerful analytical techniques. They work best when there is an agreement between participants on what the issues are. For example, hard systems approaches were used to develop the early computer systems, including those at the National Computing Centre in the UK. The adoption of this approach was probably historically inevitable, given the size and the price of the early computers. Even today, for computer-based information systems development, the systems development life cycle (SDLC) approach, mostly represented within systems analysis and systems engineering, are still in use.

Klein and Lytinen (1985) also talk of the strengths of the 'hard' systems methods as including objectivity, rigour and respect for the facts. They maintain that these methods are suitable for application to social systems in only a very restricted range of circumstances - when there is agreement among a system's stakeholders about the goals to be achieved and about the need to find the most efficient way of achieving these. Hard systems approaches dominated management theory for over a decade in the 1960s/1970s, and various strands of theoretical development tended to converge towards a systems-based approach.
that focused upon the adaptability of organisations to their environment (Jackson, 1991b; Cao, 2001).

**B. Comments on Hard Systems Thinking**

For all their successes, there have been many failures of information systems built using hard systems approaches. Systems frequently have failed to meet the objectives set for them, for example, as in the case of the original student records system as investigated for this study (see Chapter 6); while in many cases, some very high-profile, systems have simply failed to work at all and had to be abandoned, for example, the computer-aided despatch system of the London Ambulance Service (Hamlyn, 1993). These systems failed because the most important part of the systems – people, who were involved in using, or affected by, the systems, were not sufficiently taken into account; and their requirements for the systems and perceptions about the systems had not been dealt with.

As a result of frequent systems failures, in the 1980s practitioners started to look closely at the weaknesses of ‘hard’ systems approaches. It turned out that the strengths of ‘hard’ approaches were problematic when considering what was appropriate for many common situations.

Firstly, these approaches tend to be appropriate for routine operational problem situations, but are much less suitable for supporting management decision-making. Jackson’s (1993a) criticised HST by drawing attention to its limited domain of applicability. He suggested that in most managerial situations, the parties involved are likely to see the problem situation and to define objectives differently. In his view, HST fails to pay proper attention to the special characteristics of the human component in the ‘socio-technical’ systems (Jackson, 1995). People are treated as components to be engineered just like other mechanical parts of the system. The fact is ignored that human beings possess understanding, and hence are only motivated to support change and perform well if they attach favourable meanings to the situation in which they find themselves.

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4 Socio-technical systems focus on ‘social, technical and economic subsystems, their interactions, and the whole organisation and its environment’ (Jackson, 1991b).
Secondly, with HST, it is very difficult to conduct repeatable ‘experiments’ in the context of social systems, so success of a given approach in one situation may not be repeatable in another. Antill (1985) argues that with IS research, the very act of installing an information system changes the situation into which it is installed. Therefore no particular ‘experiment’ can be repeated. Checkland and Haynes (1994: 71) maintained that the problem of making predictions of social happenings “must be a matter of shared complexity, the fact that what happens is always a mix of intended and unintended effects”. He argued that “... the happenings in social systems are strongly influenced by the growth of human knowledge; the future growth of knowledge is in principle unpredictable since we cannot know the not-yet-known; therefore, the future of social systems cannot be predictable”, (Checkland and Haynes 1994:72)

Thirdly, HST lacks the concept of holism, which is defined as the contention that wholes are more than the sum of their parts, and that parts can only be understood in relation to their functions in the complete and ongoing whole (Flew, 1979). As detailed in Checkland and Haynes (1994: 60), “the method by which science deals with complexity is to divide problems into manageable parts. The assumption of this method is that the components of the whole are the same when examined singly as when they are playing their part in the whole”. This assumption is often reasonable in natural sciences, but is less so in many social situations. In particular, if we tackle a problem in a reductionist manner, an optimisation of each of the part of the systems often results in a sub-optimisation of the whole system.

C. The Relevance of HST to Information Management

As an organisation can be seen as a system, we can use the systems notion as a tool of critical reflection. As discussed earlier in this chapter, a ‘system’ represents a way of thinking about the set of interacting components. So the relevance of hard systems approaches to information management can be commented on in terms of whether these approaches can help solve problems related to the various interaction components within the organisation considered as a ‘system’.
Since HST is characterised by a search for objectivity, quantification, systematic techniques and methods, optimisation, goal-seeking and determining correct solutions to tangible problems (Flood and Jackson, 1991a), it is appropriate for well-defined technical problems. For example, it can be successfully used for such systems elements as mathematical models to help decision-making. But it was often unable to deal effectively with complicated situations such as information management which is characterised by human factors within the systems such as motivation, feeling, perception and culture.

However, while hard systems approaches have a limited application to management science in general, and to information management in particular, these approaches can be used in combination with other systems approaches (discussed later) in helping solve information systems problems.

Because experience showed that HST could not adequately address many complicated situations which involved human activities, the concepts of soft systems thinking began to develop. These are described in the following section.

2.4.3 Soft Systems Thinking and its Relevance to this Research

A. Introduction

As just mentioned, hard systems approaches were suitable for dealing with certain well-defined problems, but were found to have limitations when confronted with complex problem situations involving people with different experience and viewpoints. To overcome such limitations, systems thinkers developed a range of alternative systems approaches. These included System Dynamics, Organisational Cybernetics, and Complexity Theory to tackle complexity and change; and Strategic Assumption Surfacing and Testing, and Soft Systems Methodology (SSM), to handle the pluralism of viewpoints among the participants. This new movement of systems thinking became known as Soft Systems Thinking (SST).

This section looks at SST, which is seen as an important stage in the historical development of systems thinking. It begins with an overview of the main ideas of SST, followed by one well-known example of the soft systems
approach - SSM, and then by a number of general comments on SST. The section ends with a description of the relevance of SST to information management in organisations.

B. Overview of SST

According to Checkland (1983), in systems analysis and other hard systems approaches, the word system is used simply as a label for something taken to exist in the world outside us. The taken-as-given assumption is that the world can be thought of as a set of interacting systems, some of which do not work very well and can be engineered to work better. However, in the thinking that is embodied in soft systems, the take-as-given assumptions are different in that the world is taken to be very complex, problematical, and mysterious. It is assumed that the way of coping with the world, i.e. the process of inquiry into it, can be organised as a learning system. Thus, the use of the word ‘system’ no longer applied to the world, but to the process of the way dealing with the world. Checkland (1999) stresses it is this shift of systemicity from the world to the process of inquiry into the world which is the crucial intellectual distinction between the two fundamental forms of systems thinking, ‘hard’ and ‘soft’.

Whilst HST is characterised as reductionist, SST is highly complex and adaptive. Avison and Fitzgerald (1995) argue that it is relatively easy to model the data and processes of hard systems, but to understand the ‘real world’ it is essential to include people, who may have different and conflicting objectives, perceptions and attitudes, in the model. This is difficult, because of the unpredictable nature of human activity systems, and because the problems relate not only to techniques and tools, but also to concepts and language.

According to Jackson (1991b), the works of Churchman (1971b; 1979), Ackoff (1981) and Checkland (1981a) reflect the core of SST. To demonstrate how SST works, Soft Systems Methodology is given below as an example.
**Soft Systems Methodology**

Soft Systems Methodology (SSM) proposed by Checkland (1981a) is one of the earliest approaches of SST. It grew out of the frustration experienced by consultants trying to use hard systems approaches based on defining goals or objectives as a means of dealing with complex managerial (soft) problem situations, as those approaches simply did not work when applied to ‘messy, ill-structured, real-world problems’ (Checkland, 1985). Checkland and Haynes (1994: 148) wrote subsequently that the intention of hard systems thinkers was “simply to try to apply the hard methodology to soft problems and to observe how the methodology has to adapt if successful problem-solving were to be achieved. The approach failed in such situations and had to be reconstructed”. After a decade of research, the outcome was SSM.

As its main function, SSM, using a systems approach, allows participants to explore different ways of viewing a situation perceived as problematic. The implications of the different viewpoints are considered in terms of their *relevance*, *cultural feasibility* and *systemic desirability* (Checkland, 1981a). This methodology incorporates human factors into the development process by taking a holistic and systemic view. SSM recognises that different players may have different views about the aims, values, objectives, and purposes of the organisation, which are influenced by social and personal contexts, and individual experiences. As the process of SSM is designed to compare different views, the active participation of the organisation members is therefore essential.

One feature of SSM is that it is itself a learning system, i.e. an organised process of enquiry, the form of which is based on systems ideas. Checkland and Haynes (1994) support this, saying that the learning takes place through the iterative process of using systems concepts to reflect upon, and debate, perceptions of the real world, and again reflecting on the happenings, using systems concepts.

SSM embraces a paradigm shift, basing itself on interpretive rather than functionalist assumptions (see Burrell and Morgan in Section 2.3.2), and “shifting the emphasis from attempting to model systems ‘out there’ in the world toward
using system models to capture possible perceptions of the world” (Jackson, 2000: 326).

There have been many reported case studies of the use of SSM, including those reported by Episkopou and Wood-Harper (1986), Scholes (1987), Mingers (1992), Moyes (1993), Ormerod (1995), Stowell (1995), and Holwell (1997), but in the view of Jackson (2000: 326), this methodology “continues to be employed ‘uncritically’ in problem situations where the mobilization of different power resources by different interest groups makes genuine participation impossible”.

As SSM cannot solve all the problems occurring in the development of information systems and a variety of criticisms has surfaced. Among these have been the comments by Flood and Jackson (1991a), who point out that SSM can be considered as managerialist, reformist and unreflective, indicating that under many circumstances it would not necessarily lead to a satisfactory solution, but reinforce the existing situation by benefiting and serving those with power. Checkland (1985) defends against this by saying that SSM both attacks and defends the status quo. However, it is true that SSM does seem to focus on finding out about the existing system, and leads to attempts to improve this system, rather than attempting to consider possible radical alternatives. (A detailed description of the development of SSM is given in Appendix A)

C. Comments on SST

On the whole, SST is characterised by a number of factors. Firstly, it represents a fundamental shift in analysis. It argues that when studying human organisations a fundamentally different approach is required from the approach that is used when studying the natural world, because of the special nature of human beings. Human beings have consciousness and free will, and place meanings and interpretations on the world. Therefore, in a study of human organisations, the meaning created by those involved, and the perceptions that arise from them, cannot be excluded from analysis. Perhaps the most significant concept in SST is that it recognises that ‘human systems are different’ (Vickers, 1983). Secondly, SST arises from the dynamic interplay of the different worldviews. Problems can arise when the divergent worldviews of participants
cause conflict. Striving for optimisation, for example, is inappropriate if participants disagree about the nature of the problem. Checkland (1981b), for example, recognized that human activity systems only exist in the minds of individuals and therefore the perspective of a particular individual will affect their view of the problem situation and system objectives. The core of Checkland’s SSM was his effort to ‘take subjectivity seriously’ (Sinn, 1998). Thirdly, SST proposes abandoning the goal-seeking model, arguing that not only the ‘hows’ of the problematic situation (not of the ‘problem’) should be studied, but also, more importantly, the ‘whats’ of the situation must be debated (Churchman, 1971a).

However, not only SSM, but SST as a whole, has suffered criticism. The first broad critique of the soft approaches, from the critical systems perspective, was Jackson’s (1982) paper on the work of Churchman, Ackoff and Checkland. Jackson has three main arguments: (a) SST is an advance over HST because it recognizes the importance of subjectivity, but it is unable to deal with issues of power and social change. (b) While SST is able to explore the worldviews of different actors, it has little to say about how these views are formed and maintained, or why some dominate over others. (c) SST assumes the existence of a free, open and democratic debate among all those involved. Yet few such situations exist.

Thus, Jackson (1982) recognises both ‘hard’ and ‘soft’ approaches do not allow systems practitioners to address coercion. This has led to the recognition of ‘coercive contexts’ – those characterized by significant inequalities of power. And this, in turn, has led to the development of Critical Systems Thinking, discussed in Section 2.5.

D. The Relevance of SST to Information Management

As summarised by Flood and Jackson (1991a), SST is characterised by subjectivity, a qualitative approach, systemic methodologies, and learning and accommodation in the face of contrasting worldviews. It is concerned with ill-structured problems, and therefore is able to deal with subjectivity, with people and their perceptions and interests. As all these are seen as important features of information management, it seems that soft systems approaches can be employed
to explore the multiple perceptions of the reality, i.e. how information was should have been managed in practice.

However, as mentioned earlier, SST has been criticised for its inability to deal with power and to combine multiple methods, and for its promotion of a consensus worldview, ignoring the deep-seated conflict in organisations and society (Jackson, 1991b). Since participation is based on the idea that there is a consensus social world, the outcome of the SST will favour people in power.

Up to now, it can be concluded that both HST and SST can contribute to the management of information in some ways, but neither can be effectively used independently to deal with, or to reflect critically on, ill-structured problem situations. This leads to the necessity to examine the relevance of Critical Systems Thinking to information management.

2.5 Critical Systems Thinking and its Relevance to Information Management

2.5.1 Introduction

This section examines Critical Systems Thinking (CST). It first gives an overview of CST, followed by three examples - Critical Systems Heuristics, systems of systems methodologies, and Total Systems Intervention, to illustrate the potential applications of CST ideas in solving practical problems within organisations. The section then explores the theoretical base of CST. Challenges to CST are also identified, followed by some notes on future direction of CST.

2.5.2 Overview of Critical Systems Thinking

As mentioned earlier, although both ‘hard’ and ‘soft’ systems approaches have their strengths and special application areas, they also have their limitations. Thus, a series of critiques have followed that examined these approaches from the point of view of their theoretical foundations, history, embedded assumptions, and who they serve. As a result, CST has been developed.
It is argued that CST accepts the contribution of both functionalist (‘hard’) and interpretative (‘soft’) approaches, and through evaluation enhances awareness of the circumstances in which such approaches can be properly employed. The pragmatism of the ‘hard’ approaches, and the lack of theoretical reflection in the ‘soft’, allowed CST to expose both as special cases with limited domains of application.

CST, in its earlier versions (e.g. Flood and Jackson, 1991a; Jackson, 1991b; Jackson, 1991c), had five commitments – ‘critical awareness’, ‘social awareness’, ‘pluralism at the methodological level’, ‘pluralism at the theoretical level’, and ‘emancipation’. The five commitments of CST in 1991 had been transformed into three by 2000 (Jackson, 2000; Jackson 2003):

• ‘Critical awareness’ (swallowing ‘social awareness’);
• ‘Improvement’ (replacing ‘emancipation’);
• ‘Pluralism’ (combining ‘pluralism at the methodological level’ and ‘pluralism at the theoretical level’).

According to Jackson (2003: 303), ‘critical awareness’, as its main purpose, reviews “the theoretical underpinnings, strengths and weaknesses of different systems methodologies and methods”. It also “considers the societal and organisational ‘climate’ within which systems approaches are used”. Jackson accepts the comments from Flood and Romm (Flood, 1990; Flood and Romm, 1996) who insist that ‘critical awareness’ “must include consideration of the effects that power at the microlevel can have on the development and use of knowledge” (Jackson, 2003: 303). He also accepts Brocklesby’s (1994; 1997) suggestion that more attention be given to the various ‘constraints’ (cultural, political, personal) that hinder acceptance of CST.

‘Improvement’ is dedicated to human ‘emancipation’ (i.e. freeing oneself from restrictions). Flood and Jackson (1991b: 49) define this commitment as seeking to “achieve for all individuals, working through organisations and in society, the maximum development of their potential”.

The last of the three commitments – ‘pluralism’ is about “using different systems theories, methodologies and methods in combination” (Jackson, 2003: 41).
304), becoming aware of their strengths and weaknesses, to address a corresponding variety of issues (Midgley and Brown, 1998).

2.5.3 The Development of Critical Systems Thinking

CST came to the fore in the 1980s (Ulrich, 1983; Jackson, 1985a and 1991d), and developed rapidly in the 1990s (Flood, 1990; Jackson, 1991b, 1991c and 1991d). According to Checkland (2002), the origin of this research [on CST] was Ulrich's doctoral research with Churchman, which sought to examine the relevance of the work of Habermas (1972) to the systems world (Ulrich, 1983), and drew attention to the normative assumptions, involved in using a methodology to bring about 'improvement' in human situations. Almost at the same time as Ulrich's work was published, Jackson and Keys (1984) developed the first 'meta-theoretical framework' for systems thinking in their System of Systems Methodologies (SOSM). This was a grid of problem contexts for classifying the different assumptions made by different methodologies, with “each approach useful in certain defined areas and appropriate circumstances” (Jackson 1991b: 199). Up to this point, CST was seen as something added to 'hard' and 'soft' systems thinking, “based on Habermas’ knowledge-constitutive interests in enlightenment and emancipation” (Mingers, 1997a: 5).

The next development in CST was the development of Total Systems Intervention (TSI) (Flood and Jackson, 1991b). Flood’s (1995b: 393) description of TSI is:

“The problem solving system TSI has been developed to provide managers with a practical and useful systems-based approach to problem solving. It offers procedures to integrate all methods for problem-solving in a process which ensures that they are employed to tackle only the issues they are best suited to.”

As indicated by Flood (1995b), while still based on a critical systems philosophy, and ‘still having the achievement of human freedom as a basic principle’, TSI “mainly orients itself to the domains of consultancy and management” (Mingers, 1997a: 5).
Jackson (2000) indicates that there exist two types of CST. He refers the first to the American development which is originated from the work of Churchman and has been fully developed by Ulrich (1983) as Critical Systems Heuristics (CSH); and the second type to the UK development which can trace its origins to the critique of SST (see also Mingers, 1980; Jackson, 1982). The most representative approach of this UK development is System of Systems Methodologies (SOSM) and Total System Intervention (TSI). Detailed descriptions of these methodologies are respectively given in Appendices B, C and D.

All three methodologies mentioned above have helped shape the CST that we see today. CST has provided a much bigger picture than either HST or SST, as "it has allowed systems thinking to mature as a transdiscipline" and has set out how the variety of approaches, methodologies, methods and models, now available, can be used "in a coherent manner to promote successful intervention in complex organisational and societal problem situations" (Jackson, 2003: 278). For this research, the methodological plan was designed aiming to use various approaches, methodologies, methods and techniques in combination, in general agreement with the philosophy of CST.

Having looked at how CST has evolved, the next section examines the theoretical grounding for CST.

2.5.4 The Theoretical Grounding of Critical Systems Thinking

In Section 2.3.5 we summarised some of the key ideas of Habermas, Foucault and Kant as they relate to the domain of information systems. Here we use these insights and others to look at the theoretical grounding of CST.

According to Jackson (1998), the ideas that inspired CST came from two sources - social theory and systems thinking. Jackson (1998) stressed that of particular importance from the social sciences side was the work that allowed an overview to be taken of different ways of analysing and intervening in organisations, as in Burrell and Morgan’s (1979) work discussed earlier in the chapter. Critical social theory from Kant through Marx to Habermas and Foucault
also played a significant role. It was Marx’s theory that recognised the existence of the inequalities in society and exploitative relationships in many enterprises. While Habermas’ theory of human interests and his warnings about the dominance of instrumental reason informed reflection on the role of the various systems methodologies, they also provided justification for early attempts to conceptualise them as complementary, since they could be seen as addressing different interests (Jackson, 1998). Specifically, Jackson (1985a: 149) argued that “… Habermas’ approach is more appropriate for a certain class of social system than hard or SST methodologies … these social systems are characterised by inequalities of power and resources among the participants and by conflict and contradiction.” He went on to note that many works on CST have drawn on Habermas’ work. These include: Jackson’s (1988) own review of systems methods for organisational analysis and design; Oliga’s (1988) look at the methodological foundations of systems methodologies; Flood and Ulrich’s (1990) examination of the epistemological bases of different systems approaches; and Ulrich’s (1991) programme for systems research. Flood (1990) also argued that Habermas can be seen as contributing to a position in favour of theoretical pluralism.

From the systems thinking side, Jackson (1998) maintained that CST has inherited a set of powerful concepts. He also maintained that if the systems movement had failed in its early aspirations to create a ‘general system theory’ setting out the laws governing the behaviour of all systems, it did manage to give birth to a range of methodologies based upon the systems concepts for intervening in and seeking to improve, problem situations.

Thus in Jackson’s (1995) view, on one hand, the various social theories provided material for the enhancement of existing and the development of new systems approaches. It also provided the means whereby systems practitioners could reflect on and learn from their interventions. On the other hand, systems thinking itself assisted in the task of translating the findings of social theory into a practical form and encapsulating those findings in well-worked out approaches to intervention.
We can discuss the theoretical grounding for CST a little more explicitly by examining the three commitments of CST. By adapting from Flood and Jackson (1991a, 1991b), Jackson (2000, 2003), Midgley (1995a), and Flood and Romm (1997), the key ideas of these commitments are as follows.

**Critical awareness** means that researchers need to reflect upon the relationship between different organisational and societal interests in the situation under study, and on how these relate to the different theoretical underpinnings, strengths and weaknesses of available systems methodologies, and “the usefulness of the variety of systems models, methods, tools and techniques in the service of different methodologies” (Jackson, 2000: 375). The underpinning ideas here relate to social theories in that different parts of an organisation will have different goals and interests; and to systems thinking in that different methodologies are driven by assumptions on the different types of problem they are best able to tackle (as made clear in SOSM, for example). But a key underpinning relates back to the insights of Kant that people’s perceptions are what drives their worldview, and hence their actions, and so a significant part of critical awareness lies in understanding that it is these perceptions that have to be uncovered and reflected upon.

**Pluralism** involves looking at the philosophical, theoretical and methodological basis of the various systems approaches, and matching them to specific problem situations where they can most usefully be employed (see SOSM and TSI in the previous section). Jackson (1991b) explains that different ‘strands of the systems movement’ expressing different ‘rationalities stemming from alternative theoretical positions’ must be respected, and that the ‘different theoretical underpinnings and the methodologies to which they give rise, should be developed in partnership’. Jackson (1991d) stressed that this can be achieved by relating different systems epistemologies to the three fundamental human interests highlighted by Habermas (1972) - the technical, practical and emancipatory interests.

**Improvement** identifies the need to develop systems thinking to tackle problem situations where the operation of individual or group power hinders standard approaches to problem solving. Jackson (1991b) clearly indicated that
‘emancipation’ was one of the three human interests which, following Habermas, CST sought to support. “CST is a politically conscious and self-reflective approach, distinguished by an openly declared emancipatory interest in an equal distribution of power and chances to satisfy personal needs, and in liberating people from dominance by other people and forces they do not currently control” (Flood and Jackson, 1991b). These ideas on control of one’s destiny and emancipation follow from a long and rich line of philosophical reflection and debate that has underlain centuries of political development across the world. But in terms of the authors quoted here, the fairly recent ideas of Habermas and Foucault have been seen as key to the development of CST: Habermas looking for solutions that includes notions of inclusivity and emancipation, and Foucault warning of the need to examine who has power and to what extent this determines the accepted truth of a situation.

Overall, in terms of the above, it is important to recognise that while CST has been explicitly underpinned by social theory, this is not the case of either HST or SST methodologies. For these, the underpinning theoretical links (e.g. positivist sciences in the case of hard methodologies; and interpretivism in the case of soft methodologies) were only implicit.

2.5.5 Challenges to Critical Systems Thinking

Naturally there have been challenges to CST, including those from Mingers (1997b), Jackson (1999) and Checkland (2002). In particular, Mingers (1997b) re-thought the nature of critical intervention in the light of the areas of difficulty, and outlined two key challenges to CST, which are explained below.

Firstly, according to Mingers (1997b), there is confusion within the critical dimension of critical systems, saying that there existed many problems about the distinction between ‘critical systems’ and ‘emancipatory systems’. Particularly, Mingers (1997b) raised such questions as: can we really expect any problem-solving approach that is critical towards the status quo to be universally applicable? Wouldn’t those who gain from the status quo resist any change? Is there anything to stop an effective critical or multi-methodological approach from being
implemented? He maintained that genuinely emancipatory approaches will challenge the position of particular actors and groups within a situation, and thus cannot expect to gain the universal approval or acceptance of participants in a problem situation. Jackson (1985a) supported this, asking why those in power should listen to the powerless. Therefore, it is important to recognise that methodologies or multi-methodology can and will be used to support the status quo no matter what assumptions or commitments underpin them (Mingers, 1997b).

Secondly, Mingers (1997b) thinks critical systems can no longer rely on Habermas' theory of knowledge-constitutive interest as its underpinning. By this, Mingers means that it is no longer possible to justify a critical approach from simply a theoretical basis. He said the argument could not hold water any more that a species-wide interest in emancipation, combined with current distortions in knowledge domains, make a critical approach necessary. He claimed we should say that these approaches are desirable, not that they are necessary. Thus, he mentioned that the focus is being moved away from the abstract framework and methodologies onto the person using them, and their commitments, history, values and choices. Note that Checkland (2002) supported this view of Mingers, saying that much discussion and many papers were based on the work of Habermas, and CST was launched on this, rather than as an outcome from involvement in real situations. Mingers (1997b) concluded his argument by stressing that critical pluralism must be driven by the commitments of the agent within the constraints and possibilities of a particular, historical and contextual situation.
2.5.6 Direction of Critical Systems Thinking - Philosophical, Methodological and Theoretical Pluralism

Pluralism is one of the three primary commitments of CST, and Jackson (1987a) has identified pluralism as the desired way forward for systems thinking.

However, what is pluralism? In the broadest sense, pluralism is interpreted as the use of different methodologies, methods, models and techniques in combination, and covers both theoretical and practical aspects. According to Mingers and Gill (1997a: 244), “within CST, the main term used was complementarism, emphasizing the way in which the different methodologies were seen as complementary to each other. But in order to ‘emphasize the use of a plurality of perspectives and methodologies, nowadays, pluralism is frequently used’.

However, different researchers/practitioners differ in their approach to pluralism. As summarized by Mingers and Gill (1997b: 244):

“Midgley concentrates on methodological pluralism and the design of mixed methods; Jackson argues for pluralism as a meta-methodology – an extension to TSI; White and Taket and, from a postmodern position, argue for pragmatic pluralism at many levels, … not based on an underlying theory; while Mingers suggests a critical pluralism that tries to fuse some of the insights of both Habermas and Foucault.”

Jackson (2000) summarizes three reasons why pluralism is ‘a topic of considerable interest in applied disciplines these days’: the ‘critique’ of traditional approaches; the ‘prevailing fashion for relativism’, and the necessity for pluralism. In systems thinking, traditional ways of doing things have been challenged and new perspectives opened up. In the domain of information systems, as described earlier in this chapter, people lost confidence in the systems developed using only traditional structured methods. They did not believe that such systems would serve their users and bring competitive advantage. Thus, practitioners were increasingly combining different methods and methodologies, which in turn justified the need to formally examine the use of ‘multi-methodology’ (Mingers and Brocklesby, 1996).
Researchers, such as Landry and Banville (1992), and Mingers (1997a), put forward strong arguments in favour of pluralism in general. Two main arguments by Mingers (1997a: 9) in favour of pluralism were:

First, [...] the real-world problem situations are inevitably highly complex and multi-dimensional. Different paradigms ... focus attention on different aspects of the situation ... so multi-methodology is necessary to deal effectively with the ... richness of the real world. Second, ... an intervention is not usually a single, discrete event but is a process that typically proceeds through a number of phases, ... [which] pose different tasks and problems for the agent. However, [some] methodologies tend to be more useful in relation to some phases than others, so the prospect of combining them has immediate appeal. Even where methodologies do perform similar functions, combining a range of approaches may well yield a better result.

Jackson (2000) considered two contributions important in theorizing about pluralism in systems thinking. The first was his attempt to distinguish pluralism from three other possible ‘developmental strategies’ for systems thinking – ‘isolationism’, ‘imperialism’, and ‘pragmatism’ (see Jackson, 1987a, 1991b). In comparison with other options available, Jackson saw pluralism as offering excellent opportunities for future development. The second contribution, originated by Mingers and Brocklesby (1996), provides an overview of the three possibilities that, they believe, can exist “under the label of [methodological] pluralism”, namely, ‘methodology selection’, ‘whole methodology management’, and ‘multiparadigm multi-methodology’.

Jackson (2000) goes on to explain that there were three important landmarks in the history of pluralism in CST. The first was 1984 when Linstone (1984) published his book *Multiple Perspectives for Decision Making*, and

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5 *Methodology selection:* the agent employing methodologies regards a variety of different methodologies, based upon different paradigms, as useful and chooses a whole methodology according to the problem situation. That methodology, and its associated methods, models and techniques, which best corresponds to the demands of the problem situation will be selected. *Whole methodology management:* whole methodologies, based upon different paradigms, are employed by the methodology user, but re-used together in the same intervention. The emphasis is on how a variety of very different methodologies can be managed during the process of one intervention. *Multiparadigm multi-methodology:* this involves using parts of different methodologies, which owe allegiance to different paradigms, together in the same intervention. Here the whole methodologies are ‘broken up’ and the methods, models and techniques usually associated with each brought together in new combinations according to the requirements of the particular intervention (Source: Jackson, 2000: 378-380).
Jackson and Keys published their paper on SOSM. Jackson pointed out the weaknesses of both publications. Linstone’s approach was seen as functionalist ‘imperialism’. Although emphasizing pluralism in viewing complex problem situations, it largely ignored combining methodologies and methods in a pluralist manner to intervene in problem situations. As for SOSM, the main weaknesses, in his view, were its privileging of methodologies in the same intervention, and its failure to make an adequate distinction between methodology and methods.

The second landmark was TSI (Flood and Jackson, 1991a). Jackson (2000) explains, as mentioned earlier, that TSI sought to justify pluralism in each of its three phases – ‘creativity’, ‘choice’, and ‘implementation’, and that it set out a meta-methodology for using methodologies adhering to different paradigms in the same intervention in the same problem situation. However, TSI was thought to be uncritically adherent to Habermas’ early theory of human interests and it did not pay any attention to its ‘agents’ and ‘the process of intervention’.

The third landmark was the ‘gradual acceptance’ of the ‘essential’ flexibility gained by extracting methods, models, tools and techniques from different methodologies, and using them in combination. It was noticed that in operations research, an increasing number of researchers, such as Ormerod (1995), were willing to combine various methods, tools and techniques in one intervention in their practice, but they did not give adequate consideration to the philosophical and theoretical aspects of pluralism.

Jackson (2000: 424) concludes by the statement that “CST is about constantly reflecting on the limitations and partiality of our understanding”. He explains that CST ‘seeks improvement, and evaluates it, on the basis of the nine ‘E’s – ‘efficiency, efficacy, effectiveness, ethicality, elegance, empowerment, emancipation, exception and emotion’. However, these criteria may be contradictory to each other. But CST makes us aware of such problems.

Having described the philosophical grounding and the theoretical underpinning of this study, in the next section attention is turned to the practical aspects of the research, i.e. the elements of an information strategy framework that draw insights from organisation and management theories.
2.6 Organisation and Management Theories and Their Relevance to Information Management

This section discusses some key elements of an information strategy that draw on ideas taken from mainstream organisation and management theories. Topics covered include: environment analysis, organisational culture and structure, resource management, competitive advantage, strategic alignment, and management of strategic change. We start with environment analysis.

2.6.1 Environment Analysis

Various theoretical approaches have been described in the literature to allow organisations to develop rational strategies for anticipating and coping with change in their environment. The relationship between an organisation and its environment is important, and one should always look at ‘the system’ in terms of the wider system of which the organisation is only a part.

Figure 2.3 indicates an analysis conducted by Campbell et al (1999). They liken an organisation’s environment to the skin of an onion, where this comprises concentric strata of influences that can affect the organisation, from the external macro-environment, via the external micro-environment to the internal environment.

![Figure 2.3 External Environments (Adapted from Campbell et al, 1999)]
According to the authors, the external *macro-environment* contains influences that affect not only the organisation itself, but also the rest of the players in the ‘industry’\(^6\). The external *micro-environment*, by contrast, is the sphere in which the organisation interacts normally on a day-to-day basis. While the macro-environment is generally beyond the influence of the individual organisation, it can have significant impact on the micro-environment in which the organisation operates.

Changes in the macro-environment can produce immense impacts on an organisation. In terms of commercial organisations, such changes can make markets expand or contract and determine the level of competitiveness within an industry, and are capable of bringing about the birth or death of an entire industry. Therefore, it is essential that an organisation be alert to actual and potential changes in the macro-environment, and that it anticipates the potential impacts on its day-to-day business.

One widely used technique for dealing with the complexity of the macro-environment is the ‘PEST’ model. This divides the influences of the macro-environment into four broad categories, whose initials make up the acronym *PEST*: Political, Economic, Socio-demographic, and Technological influences. Analysis of the *political* environment refers to developing an understanding of that part of the macro environment which is under the control of the government (e.g. monopoly, taxation, or green issues). Analysis of the *economic* environment centres on changes in the macro economy and their effects on the organisation and its ‘consumers’ (e.g. GNP trends, cyclical issues, interest rates). The *social* environment is concerned with understanding the potential impacts of society and changes on the organisation and its markets (e.g. demography, lifestyle, mobility, education, work-leisure). Analysis of the *technological* environment involves

\(^6\) For the purposes of their analysis, Campbell et al (1999) define an *industry* as a group of firms producing similar goods or services for the same market. In education terms, it may be assumed that all HEIs comprise a single ‘industry’.
developing an understanding of the effects of changes in technology on all areas of an organisation and its activities.

Since macro-environmental influences are largely beyond an organisation's control, the strategy an organisation adopts usually attempts to increase its ability to cope with any of the changes envisaged in the macro-environment which may have a significant influence on the effectiveness of the organisation's operation. In strategic information management, for example, a key skill therefore is to be able to predict changes in any of the PEST influences, and to take account of these by being flexible and responsive in the process of developing and implementing the information strategy.

Changes in the micro-environment can also affect an organisation quickly and, sometimes, dramatically. In the case of commercial organisations, the micro-environment generally comprises influences from the competitive environment - its industry and markets. These ideas translate across to the activities of HEIs where the 'industry' is all HEIs taken together, and where the 'markets' are the external demand for educated students, and for research results.

Another well-known technique for environment analysis is 'SWOT' analysis, where the letters stand for the organisation's Strengths, Weaknesses, Opportunities and Threats. While opportunities and threats apply mainly to the external environment, internal analysis can be approached using the first half of SWOT analysis, where this involves a detailed assessment of the strengths and weaknesses within an organisation.

2.6.2 Organisational Structure

Organisational structure (as opposed to organisational culture) generally relates to the formal inter-personal arrangements and responsibilities that an organisation puts in place to enable it to carry out its daily activities. According to Johnson and Scholes (1993), the formal organisational structure is likely to reflect power structures, to identify important relationships, and to emphasise what is seen as important within the organisation.
Mintzberg et al. (1998) examines how organisations are structured and focuses on a number of organisational configurations. They explain that the type of structure an organisation adopts depends on its external environment. Mintzberg et al. (1998: 344) lists four different organisational structures based on the various characteristics of its environment, as follows: “The more dynamic an organisation’s environment, the more organic its structure; the more complex an organisation’s environment, the more decentralised its structure; the more diversified an organisation’s markets, the greater the propensity to split it into market-based units, or divisions, given favourable economies of scale; while extreme hostility in its environment drives any organisation to centralize its structure temporarily.”

It is well recognised that organisations can differ with regard to the level of internal control their employees experience or prefer. For example, in some organisations, people have a strong desire for order and structure - clear tasks, responsibilities, powers, rules and procedures. Ambiguous situations and uncertain outcomes are disliked, and therefore management strives to control the organisational process.

In order to reduce uncertainty, management often offers an organisational structure by following traditions, or by imposing top-down paternalistic rule. However, uncertainty can also be reduced by strategic planning. By setting direction, co-ordinating initiatives, committing resources, and programming activities, structure can be brought to the organisation.

There is little agreement on how the variety of organisational structures should be classified. Jackson (1987a), for example, argues that one should use the metaphors of organisation developed by Morgan (1986) as a basis for taking alternative views of organisation, and looks at four particular views: organisations as machines, as organisms, as cultures, or as coercive systems. A mechanistic view, for instance, sees an organisation as a machine, within which rule-based systems can be used to control operations in a deterministic environment, i.e. one in which, if the inputs to the process are known, the outputs can be predicted with a high degree of certainty.
Mintzberg et al (1998: 333), by contrast, sees organisational structure in terms of six typical basic parts of an organisation. These are:

- **Operating core** - the people who do the productive work in the organisation;
- **Strategic apex** - the ‘top’ of the organisation, where the whole system is overseen;
- **Middle line** - a hierarchy of authority (managers) between the operating core and the strategic apex;
- **Techno-structure** - is composed of ‘analysts’, who plan and control formally the work of others, but are not in the hierarchy of control, and are often labelled ‘staff’;
- **Support staff** – those who provide various internal services (e.g. catering, mailing, marketing, and security);
- **Ideology** - a strong culture that is embedded in all levels of the organisation or ‘surrounds’ the whole system.

Clarke (2001a) warns that ‘bureaucratic’, ‘hierarchical, ‘matrix’ and other organisational structures appear regularly in the literature, but offer little help to those wishing to determine their type of organisation in order to match some aspect of organisational practice to given organisational forms. To the strategic thinker this has been limiting: strategy cannot be formulated and implemented independently of the type of organisation concerned.

In addition to an organisation’s *structure*, its *culture* also helps shape its strategies. This is recognised by Brown (1995) as having a significant impact on its performance. This topic is discussed next.

### 2.6.3 Organisational Culture

Commonly used definitions from the literature for the term *organisational culture* include:

- A family of concepts like symbol, language, social drama and ritual (Pettigrew, 1987).
• The behaviour patterns and standards which bind a social group together and which are built up over many years and is a unifying philosophy, ethic and spirit (White, 1984).

• A set of basic tacit assumptions about how the world is, and ought to be, that a group of people share and that determines their perceptions, thought, feelings and, to some degree, their overt behaviour (Schein, 1996).

In addition, Mintzberg et al (1998: 333) imply that a strong culture 'encompasses the traditions and beliefs of an organisation that distinguish it from other organisations and infuse a certain life into the skeleton of its structure'.

In any decision-making process, culture carries an important influence. Managers draw heavily on these aspects, which are built up over time, and which are especially important at a collective organisational level. According to Johnson and Scholes (1993), these beliefs and assumptions are likely to be 'hedged about' and 'protected' by the various aspects of organisational culture, including routine, rituals, stories, symbolic aspects, control systems, power structures and organisational structure, which is called, by the above authors, the cultural web of an organisation.

Another view is provided by Wit and Meyer (1999). They implied that cultures differ with regard to the level of control that organisational members prefer to have over their environment. At one extreme are cultures in which people strive to manage, or even dominate, their surroundings. In these organisations, there is a strong desire to create the future, and a fear of losing control of one's destiny. The consequence is that these organisations are strongly drawn to pro-active and deliberate strategy making, under the motto 'plan or be planned for' (Ackoff, 1981). Drawing up plans to actively engage the outside world meets people's need to determine their own fate. At the other extreme are cultures in which most people passively accept their destiny. They believe that most external events are out of their hands, and that they exert no control over the future. In such highly fatalistic cultures people tend to approach opportunities and
threats reactively, on a day-to-day basis. Such behaviour rarely leads to emergent strategy, but more often to disjointed, unpatterned action.

In the middle are organisational cultures in which people believe neither in domination of, nor submission to, external circumstances. In these cultures, people accept that events are unpredictable and that the environment cannot be tightly controlled. Yet they trust that individuals and organisations can proactively seek their own path among these uncertainties. The environment and the organisation, it is thought, co-evolve through interaction and mutual adjustment, often in unforeseen ways. This requires organisations to develop an attitude of receptivity and high adaptability to changing conditions (Maruyama, 1984).

The next topic looks at the management of resources needed to implement an information strategy.

2.6.4 Resource Management

Resources are the ‘inputs’ (such as raw materials, employees) that enable an organisation to carry out its activities. The success of an organisation rests in large part upon the efficiency by which it converts its resources into outputs (such as products and services).

Resources can be either tangible or intangible (Campbell et al, 1999). In the commercial world, tangible assets include human, financial, and physical materials (machinery, buildings, equipment, stocks, etc.). Intangible resources include: skills, knowledge, patents rights, legal rights, brand names, registered designs, etc. (see also Coyne, 1986; Hall, 1992). In HEIs, the intangible resources may include the knowledge and experience of the staff, and the effectiveness of its information systems.

For analysing an organisation’s resources, the following two frameworks from Campbell et al (1999) can be employed to provide a comprehensive review.

First, one can consider resources by category, such as human, financial, technology, and materials. These resources are then evaluated quantitatively - how much/many, and qualitatively - how effectively they are being employed. Physical resources such as buildings, machinery or computers, according to the above authors, can typically be audited for capacity, utilisation, age, condition,
contribution to output, and so on. Human resources can be considered in terms of
‘number, education, skills, training, experience, age, motivation, wage costs and
productivity in relation to the needs of the organisation’.

Second, resources can be evaluated on the basis of how they contribute to
internal and external measures of performance. Internal measures include their
contribution to the organisation’s objectives and targets - financial performance
and output measures; measures of performance over time; or divisional
comparisons. External measures include comparisons with competitors,
particularly those who are industry leaders and those who are the closest
competitors and are in the same strategic grouping; and comparisons with
companies in other industries. As opposed to resource assessment, an approach
for resource planning has been outlined by Johnson and Scholes (1993). They see
resource planning as entailing two levels - first, the broader issues of how
resources should be allocated between the various functions, departments, or
divisions; and second, the more detailed issue of how resources should be
deployed within any one part of these. From Johnson and Scholes’ (1993)
planning framework for strategy (see Figure 3.3 in Chapter 3), the relationship
between strategy and resources appears as if the formulation of strategy comes
before its implementation through resource planning. In fact, resources
capabilities are a fundamental issue in strategy formulation and may involve a
change in the allocation of human and material resources based on the practical
situation of the organisation.

It is important that when thinking about how an information strategy will
be put into effect, detailed thought is given to the feasibility of its implementation
from the point of view of resources. It is also important to understand how the
detailed operational resource plans fit the overall strategies of the organisation.

The next section addresses the issue of an organisation’s competitive
advantage, stressing, in this case, the importance of information rather than
information technology.
2.6.5 Competitive Advantage

In his book, *Competitive Strategy*, Porter (1980) develops what is now a popular framework for analysing the structure of an industry from the viewpoint of its attractiveness to a player already in the industry. Porter argues that there are five competitive forces which operate in an industry and which together determine the potential profitability of that industry. These are: rivalry among existing firms/competitors, the threat of new entrants, the bargaining power of buyers, the bargaining power of suppliers, and the threat from substitute products or services.

In terms of the linkage between competitive advantage and information, Clarke (2001a: 155), explains: “where rivalry is strong, organisations can use information to keep pace with or ahead of competitors”. He suggests that the threat of new entrants be reduced by “barriers to entry, such as the high cost of acquiring and using the necessary information systems”; and that “the lower the cost of [information systems] acquisition, the greater the need to be better at using them”. The threat of substitute products, for example, implies a need for information about such products, and indicates an area where information management is likely to be crucial. Finally, in the author’s view, suppliers and buyers positions are “best managed through dynamic information on the supply and customer chains”, a strategy adopted, for example, by airline companies.

From the empirical studies of Adcock et al (1993), Clarke (2001a) found strong evidence that organisations must concentrate on the effective use of IT and IS, in line with the objectives and goals of the organisation as a whole. The message is: not to plan for competitive advantage from information, but to strategically manage information more effectively, and accept the advantage this gives. Overall, Clarke (2001a: 149) comes to the conclusion that through the last two decades, “the focus for competitive advantage has moved away from IT and towards IS, highlighting the use made of the technology within a given organisation rather than just the technology itself”. He suggests that IT and IS should be integrated into an organisation, and that it should be the organisational system which is the focus of attention.
2.6.6 Strategic Alignment

Henderson and Venkatraman (1993) propose a strategic alignment model covering the linkages between four domains in an organisation covering business strategy, the business processes, IT strategy, and IT processes (Figure 2.4). The authors distinguish between two main perspectives on how the alignment between the domains can take place. In the first perspective, it is the business strategy which is the driving force for the business process and IT strategy, and ultimately affecting the IT process. In the second perspective, it is the IT strategy which drives the IT process and business strategy, ultimately affecting the business process.

![Figure 2.4 Strategic Alignment Model (Henderson and Venkatraman, 1993)](image)

Smits et al (1997) analyse specifically the linkage between information strategy and business strategy in a number of ways, as follows: by looking at the attitudes of senior managers (as a part of the information strategy environment); by analysing the information strategy process (with roles, methods and co-ordination); by analysing the content of the strategy, and by looking at how its effects are evaluated. The above authors support these analyses by using a research model (see Figure 2.5) that focuses on four components of information strategy: environment, process, form and contents, and effects. The relationship of the four components can be explained as: the environment influences the process.
which produces the content (the output of the strategy process), which yields the effects, which change the environment (the impact of the strategy).

![Diagram](image)

*Figure 2.5 Research Model Describing Four Components of Information Strategy (Adapted from Smits et al, 1997)*

Smits et al (1997) recognise that the model is based on the idea of contextualism (Pettigrew, 1987) which considers a strategy in terms of three interrelated components: context, process and content. In contextualism, the main focus is to trace the dynamic interlinking between aspects of the components over time. One important link is how previous strategies affect the actual environment, and how this again influences the strategy process and content. In the model, Smits et al (1997) maintain that they could discriminate between: (i) circumstances influencing the strategy process; (ii) effects and impact of current and previous strategies, and (iii) how (ii) influences the current process. With regard to information strategy, the authors stress that contextualism encompasses also the relationships between aspects of information strategy, IT processes, business strategy and business processes.

The next section looks at yet another facet of implementing an information strategy, the management of strategic change.
2.6.7 Management of Strategic Change

People hold different views on managing strategic change. Some writers, such as Mintzberg and Westley (1992), take a rather mechanistic approach, suggesting that there is a set of 'levers' for change which managers can employ. Other writers emphasise the role of the individual as change agent, sometimes laying particular stress on the charisma and vision of the leader. The role of strategic change can be highlighted by the method of gap analysis, asking the question: what must we do, to get where we want? This is illustrated in Figure 2.9. The difficulty, of course, is how to make the changes that are desired.

![Figure 2.6 Gap Analysis](image)

Organisations are complex systems, consisting of many different elements, each of which can be changed. Many frameworks exist that disassemble organisations into a number of components, to help analysts in gaining an overview of an organisation's composition, and hence assist the process of change. Mintzberg and Westley (1992) proposed a framework (see Figure 2.7) which first distinguishes between change in the sphere of organisation, and the sphere of strategy. Altering the state of the organisation has traditionally been the focus of the field of organisational behaviour, while changing the direction of the organisation has been central to the field of strategic management. The two
spheres are linked, and both need to be discussed to understand organisational change. However, as Wit and Meyer (1999) point out, changes in one sphere are not always accompanied by full and simultaneous changes in the other.

<table>
<thead>
<tr>
<th>More Conceptual (Thought)</th>
<th>Changes in Organisation (State)</th>
<th>Changes in Strategy (Direction)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Culture</td>
<td>Vision</td>
</tr>
<tr>
<td></td>
<td>Structure</td>
<td>Positions</td>
</tr>
<tr>
<td></td>
<td>Systems</td>
<td>Programs</td>
</tr>
<tr>
<td>More Concrete (Action)</td>
<td>People</td>
<td>Facilities</td>
</tr>
</tbody>
</table>

*Figure 2.7 Levels and Spheres of Organisational Change (Mintzberg & Westley, 1992)*

Second, Mintzberg and Westley (1992) distinguish between different levels of change, from the broadest, most conceptual level, to the narrowest, most concrete. Clearly, changes at the various levels are again linked, and understanding organisational change requires a holistic view of the entire range. Not all organisational changes are strategic. According to Wit and Meyer (1999), only changes that affect the top two levels - vision and position, and culture and structure, should be considered as ‘strategic change’.

Yet another approach is that of Johnson and Scholes (1993), who promote business process re-engineering. This is the process of reconfiguring activities to create an improvement in performance, greater efficiency but at lower cost, and focusing on added-value.

The authors note that in understanding the processes of strategic change, it is important to distinguish between *incremental* change process and *transformational* change process. A systems view of incremental change, according to the authors, sees the existence of an organisation as a social system built on ‘influence paths’ or ‘loops’. This view suggests that organisations can change by mutually reinforcing and amplifying stimuli within their systems. It is change on the basis of the current ways of doing things, i.e. *incremental change* (Johnson and Scholes, 1993: 388). The authors explained that a *change agent*
seeking to manage change incrementally would search for ways in which changes could be made within current systems, which would have the effect of amplifying change.

In transformational change, change takes place by more substantial shifts. According to Johnson and Scholes (1993: 388), such change may come about

“either because the organisation is faced with major external events that demand such large-scale change, or because the organisation anticipates such changes and therefore initiates action to make major shifts in its own strategy, or because the cumulative effects of strategic drift lead to deteriorating performance and require transformational strategic change”.

In Johnson and Scholes’ (1993) view, most strategic change within organisations is incremental, with more transformational changes occurring occasionally. The authors argue that this is beneficial, as incremental change builds on the skills, routines and beliefs of those in the organisation, so change can be efficient, probably smooth, and most likely win the commitment of those in the organisation.

The above authors believe that to diagnose strategic change needs, it is necessary first to assess the extent to which incremental or transformational change is required, or in other words, to detect strategic drift. Having assessed the type of change that is appropriate in an organisation, then, it is useful to identify the specific barriers to change in order to decide what levers and mechanisms of change are likely to be helpful. Here Johnson and Scholes’ (1993) culture web can be useful, by providing a framework for identifying the aspects of the organisation that will tend to preserve the current assumptions and ways of doing things. For example, routines, control systems, structures, symbols and power or dependency relationships can all be important blockages to change. However, according to the above authors, the identification of such blockages can help to provide an agenda for considering appropriate mechanisms for change.
2.7 Chapter Summary

This chapter has presented an overview of the theoretical literature reviewed for this research project. This chapter opens by giving a brief rational for the choice of literature reviewed. This included discussing the ideas that information is not simply data, but concerns how people perceive and react to such data. The chapter then discussed the notion of a ‘system’, and follows this by introducing the work of Kant. The latter is a prime focus of the thesis, where Kant emphasised the need to uncover people’s perceptions of a situation, rather than considering the situation as ‘objective reality’.

The next section in the chapter described the social theories that underpin the thesis. Burrell and Morgan’s classification of social theory paradigms was adopted to allow the general placing of various social and critical theories to be understood. Then the works of three critical social philosophers – Habermas, Foucault and Kant were reviewed, as these contribute to the theoretical base for the development of Critical Systems Thinking (CST), where the latter informs the empirical research of this thesis.

Habermas maintained that humans seek to achieve three interests - technical, practical and emancipatory. The implication of these interests is that the methods employed for any research investigation must be pluralist in its social-theoretic viewpoint and pluralist in the actual research methodologies used. In addition, Habermas’ conceptualisation of the ‘ideal speech situation’ helped IS researchers and designers recognize the importance of socially effective communication in systems design. Though there have been criticisms of Habermas’ work it is recognised that Habermas’ views have helped identify the need to examine types of knowledge and issues of emancipation when seeking systems solutions to real-world problems.

In Foucault’s view, power is not possessed, but exercised, and power and discourses work to constrain people. Foucault proposed that truth was largely determined by the people in power. So emancipation to Foucault is a stronger concept than to Habermas, it does not simply mean having scope within an
organization to realise one's own potential, but would imply a real removal of power from the powerful.

Kant inquired into the fundamental limits of knowledge, and hence set the scene for later work on the significance of people's understanding of their world. Kant insisted that people can only know the world through their five senses, Therefore, whatever are the 'objective realities' out there, these cannot be known; people only know what they see, hear, taste, touch and smell; and what they think in response to these stimuli. As mentioned above, the implication for this thesis is the need to use inquiry procedures that uncover people's perceptions and the reasons that drive these, and to employ intervention methodologies that take account of perceptions, viewpoints and motivations.

The literature review then focussed on the change from hard systems thinking (HST) to soft systems thinking (SST) in information systems development. HST is characterised by a search for objectivity, quantification, systematic techniques and methods, optimisation, goal-seeking and determining correct solutions to tangible problems (Flood and Jackson, 1991a). Hard systems approaches are popular in using mathematical models to help decision-making, and are judged appropriate for well-defined technical problems. However, they are often unable to deal effectively with complicated ill-structured situations characterised by human beings in the system. Thus, soft systems thinking (SST) came into being, with its argument that the study of human organisations should be based on subjective meaning and interpretation, and hence differs fundamentally from the approach required for studying the natural world. SST was developed specifically to deal with people, and their perceptions, values, and interests. SST has many advantages over the HST, but it also has limitations. For instance, it is criticised for being unable to help practitioners address the problem of coercion. SST is also criticised for its inability to combine multiple methods, which led to the necessity of examining methodologies that incorporate a plurality of approaches.

This approach is covered in the following section of the chapter, entitled Critical Systems Thinking (CST). CST is based on critical social theories, and developed from critiques of hard and soft systems thinking. It accepts the place of
both these approaches, but also emphasizes the 'oppressing and inequitable' nature of many social systems. CST is characterized by three commitments – to critique, emancipation and pluralism. Three examples of critical systems approaches were examined (see Appendices 2.2 to 2.4): Critical Systems Heuristics (CSH), System of Systems Methodologies (SOSM), and Total Systems Intervention (TSI).

CSH studies existing systems to discover whose interests these systems serve through the use of twelve critical heuristic boundary questions that are put in the 'is' or 'ought' mode. It is shown that while CSH goes some way to challenge power, it has no procedures for examining and overcoming the underlying political and economic forces.

SOSM provides a unified approach that draws on the strengths of the relevant methodologies, and allows their complementary and informed use in dealing within a problem situation. However, it pays little attention to how to coordinate different methodologies in the same intervention.

TSI is also based on complementarist ideas, but is seen as a meta-methodology seeking to operationalise pluralism in a seemingly varied and changeful social world. As yet, TSI has not been widely applied in practice, perhaps partly because it calls for high levels of competence from its practitioners.

Having examined examples of CST, the theoretical base and main challenges to CST were then presented, followed by the current direction of systems thinking. As one of the three primary commitments of CST, pluralism is discussed in detail, as a desired way forward for system thinking.

In essence, an increasing number of researchers and practitioners found that no one paradigm – neither hard, nor soft, nor critical, could capture the richness of real-world situations, and that critical pluralism seemed to be the way forward in systems thinking. As noted in the chapter, in all disciplines including information systems, the acceptance of paradigm isolation began to 'break down' (Mingers, 1997a), and in the last decade, the debate, led by Mingers and Jackson, has turned to various forms of pluralism, in both methodological and philosophical terms. In social and educational research, 'methodological pluralism grew up in practice before theory'; while in OR and systems research, CST has
been the focus of discussion in recent years regarding 'orchestrating' the use of different methodologies (Mingers, 1997b).

By contrast to the above rather social-theoretic approaches, the more practical perspectives of an information strategy are informed from existing general organisation and management theories. These cover analysis of an organisation's internal and external environments, including organisational structure and culture, resource management, competitive advantage, strategic alignment, and the management of strategic change. Examples include:

*Changes in the external environment:* These are normally beyond an organisation's control, but may have immense impact on the organisation. Various standard management analyses, such as the 'PEST' analysis, may be useful in identifying approaching changes, and it is important to be able to take account of these by being flexible and responsive in developing and implementing an organisation's strategy.

*Organisational structure and culture:* These are key elements of an organisation's internal environment. It is shown that the type of structure an organisation takes depends in part on its external environment, and that organisational culture carries important influences on any decision-making process.

*Resource:* In terms of an organisation's resources, ways of evaluating these are given, and it is stressed that when thinking about putting an information strategy into practice attention should be given to the feasibility of its implementation from the point of view of both tangible and intangible resources.

*Competitive advantage:* An organisation's competitive advantage in the area of information comes from the use of technology and information systems, and from the interaction of interdependent sub-systems within the human activity system. Clarke (2001a) concludes that this kind of competitive advantage is not planned for in any instrumental sense, but is the natural outcome of information which is strategically managed.

*Strategic change:* Finally, different views on managing strategic change were presented and matrices for selecting methods and styles of management change depending on an organisation's characteristics and type of change being
considered were described. Such matrices potentially help the implementer of an information strategy decide how various changes necessitated by the introduction of the strategy can best brought about.

Overall, the literature reviewed in this chapter has set the theoretical and philosophical background for this research work. The next chapter presents empirical literature review.
CHAPTER 3

EMPIRICAL LITERATURE REVIEW
CHAPTER 3
EMPIRICAL LITERATURE REVIEW

3.1 Introduction

After the discussion of the theoretical literature in Chapter 2, the main focus of this chapter is on practical aspects of information strategy development in UK HEIs. As outlined in Figure 3.1, this chapter begins with a brief description on the conceptual ideas from literature on strategy and information strategy to provide a context for the study of information strategies in HEIs. This is followed by background to information strategy development in HEIs; the listing of relevant empirical literature; JISC (the Joint Information Systems Committee) Guidelines for information strategy development in HEIs; and the approaches to such development adopted by JISC's pilot sites. The latter focuses on what prompted these institutions to develop information strategies, how they formulated such strategies in practice, which people were involved, how the information strategy linked to corporate strategy, and how the results were perceived. The Chapter ends with a summary of findings.

The empirical information in this chapter is presented within the context of JISC's information strategy activities in UK higher education aiming at understanding the processes for, and possible changes in the approaches to, information strategy development. The purpose was to learn how information-intensive organisations, such as HEIs, make plans with respect to the management of their information, and also how this relates to the planning of information technology and information systems within those organisations.
The next section discusses the concepts of information strategy, with different views by researchers and practitioners being presented.

3.2 Strategy and Information Strategy

3.2.1 The Concept of Strategy

Strategy, in a business environment, is defined by Porter (1990) as an integrated set of actions aimed at increasing the long-term well-being and strength of an enterprise relative to competitors. This definition is straightforward, and fits well with the concept of commercial competitive advantage, but strategic management in an academic environment is somewhat different. Johnson and Scholes (1993) define strategy more broadly as the direction and scope of an organisation over the long term, which achieves advantage for the organisation through its configuration of resources within a changing environment, to meet the needs of markets, and to fulfil stakeholder expectations. The literature on strategy
has many other, often similar, definitions, but the above two cover what is required here.

It is critical to recognise that strategy can be considered either as the outcome of planned, or of emergent, strategic decision-making. The strategic management paradigm sees strategy as formulated and implemented through a centralized planning approach based on rational analysis (Schendel and Hofer, 1979). But strategy can also be conceived as an emergent, decentralised approach, where strategy is developed as a pattern from important organisational decisions (Mintzberg, 1978, 1994a).

Mintzberg (1987) highlighted this 'strategy as a plan' versus 'strategy as a pattern' debate; while Quinn (1980) made a similar distinction between planned and incremental strategies. These two views of how a strategy actually develops and operates within an organisation are illustrated (by the researcher) in Figure 3.2.

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**Figure 3.2 Two Opposite Views on Strategy**
As illustrated, the planning strategy approach has the strategy as being fully top-down; that is, being fully decided by managers at the outset, and having a sequence of well-defined tasks that are then imposed 'top-down' throughout the organisation. This approach would have an organisation writing a future plan for a fixed period, against which future performance would be assessed. The alternative paradigm sees the strategy as emerging from within the interactions, needs and perceptions within the organisation, and being communicated upward to management.

The planning approach to strategy conceives strategy as a formal process by which senior management establishes decision rules to guide and coordinate the organisation’s longer-term actions (Ansoff, 1988). This approach originated from Ansoff’s (1964) work of the ‘design school’ which is further traceable to scientific reductionism based on hard systems thinking: objectives are identified; the current situation determined; and ‘strategy’ is then concerned with finding the best way to close the gap between the aims and the current situation. The characteristics of Ansoff’s ‘design school’ are summarised by Clarke (2001a) as: complete strategy formation always precedes implementation; responsibility for strategy rests with senior management, who are placed in a command-and-control position in relation to the environment; strategies emerge from the design process, fully formulated and ready to be chosen; and there is no room for an emergent view.

Schendel and Hofer (1979) held a similar view, and elaborated the strategic management paradigm by incorporating a number of rational steps in a centralized strategy development process, e.g. goal formulation, competitive analysis, strategy formulation, evaluation, implementation, and control. These approaches are reflected across large parts of the strategy literature (e.g. Porter, 1980, Richards, 1986; Goold and Quinn, 1993; JISC, 1998b).

The planning approach to strategy is well illustrated by the planning framework for strategy proposed by Johnson and Scholes (1993). The framework is composed of strategic analysis, strategic choice and strategic implementation (see Figure 3.3).
The planning process of strategy begins with strategic analysis which has three elements including the survey of the environments (to gain an understanding of the organisation's culture and power relations; and its external opportunities and threats); the identification of stakeholder expectations; and the analysis of the organisation's strategic capability through the analysis of its resources and capabilities. Strategic choice then allows the identification and evaluation of strategic options, and the selection of the relevant strategies. Strategy implementation converts the chosen strategy into action through resource planning and allocation, review and redesign of organisation structure, and the development of systems to manage the strategic change.

Mintzberg (1987) states that virtually everything that has been written about strategy-making depicts it as a deliberate process. By contrast, Clarke
(2001a) argues that the evidence shows this not to be the case, with strategies emerging from the organisation without having a deliberate plan. Quinn (1980) has a similar idea, stressing that for many organisations whilst strategic planning forms part of the bureaucratic control process, most important strategic decisions seem to be made outside this formal planning structure. However, Mintzberg et al. (1998) also challenges the standard ‘rational-analytical’ approach: the goals and objectives of strategic planning as determining what is to be achieved and when, but not how the results are to be achieved.

Mintzberg (1994b) points out that, as managers can often take independent actions that influence the organisation’s strategic development, strategy can emerge without the engagement of top management. In other words, emergent strategic decision-making practices can involve managers through autonomy that allows them to take actions that have strategic consequences, and through their participation in the organisation’s important strategic decisions.

### 3.2.2 The Concept of Information Strategy

Interest in information strategy has accelerated since the beginning of the 1970s (Smits et al, 1997), and many terms have arisen which more or less cover the scope of information strategy. These include information systems strategic planning (ISSP), strategic information systems planning (SISP), information systems strategic management (ISSM), etc. For an extensive review of the literature, one can look at Earl (1989), Galliers (1993), Fitzgerald (1993) and Clarke (2001a).

Strategic information systems planning (SISP) is defined by Lederer and Sethi (1988) as the process of deciding the objectives for organisational computing and identifying potential computer applications which the organisation should implement. However, Galliers (1991) sees SISP in much wider terms, and views computing as only a part of SISP. Other parts of SISP thus include: IT strategy, information management (IM) strategy, management of change, and human resources strategy. Earl (1989) sees SISP in similar broad terms: as a
combination of IS strategy (aligning IS with business goals, and exploiting IT for competitive advantage), IM strategy and IT strategy.

Perhaps Smits et al (1997) gives the most suitable definition, which defines information strategy as a complex of implicit or explicit visions, goals, guidelines and plans with respect to the supply and the demand of formal information in an organisation, sanctioned by management, intended to support the objectives of the organisation in the long run, while being able to adjust to the environment. Thus, an information strategy, in the broadest sense, is a strategic plan to exploit information resources.

JISC (1998a) defines an effective information strategy in a HEI as a management tool to ensure that investment in information, IT, IS and services is efficient, and effective and that information produced within the institution is exploited to the benefit of the institution. That is to say, an effective information strategy must ensure that the investment in information provides good value for money.

The aim of an information strategy, according to Ward et al (1996), is to ensure that the organisation obtains the greatest possible real value from its information resource, and to enable the cost-effective management and protection of information. They also hold the view that information management comprises activities including the acquisition, protection, utilisation, accessibility and dissemination of information, and the promotion and management of activities to derive maximum benefit from the resource. However, such activities have to involve people in the information system, those who are involved and affected by the way the information is handled.

Comparison of the definitions of information strategy bring out the various features encompassed by an information strategy. The SISP definition tends to focus on applications and technology; the definition by Smits et al (1997) concentrates on the use and importance of information in an organisation, starting with the planning of information, and in the end 'influencing IT, as well as influenced by IT'; while the JISC definition, which is perhaps most suitable for academic institutions, stresses the fundamental functions of an effective information strategy.
As many key issues of information management turn out to be human issues, dealing effectively with these should take into account participants' perceptions of the problematic situation. This leads to the need to properly understand how people perform and interact within the system, as a function of their social settings, backgrounds and constraints. To achieve this, it is important to draw on established underpinning social theories to help understand how existing work on social philosophies, and processes, can be employed to inform the development of a successful information strategy. The next section therefore looks at these social theories.

3.3 Background to Information Strategy Development in HEIs

The original driver for the introduction of information strategies to UK HEIs was work carried out by JISC. In the 1990s UK higher education was in a period of rapid expansion, and many universities were struggling with reduced levels of funding and increased numbers of students; the latter with very varied educational backgrounds and expectations of HE. As one aspect of helping HEIs keep pace with these developments, while maintaining the quality of HE, JISC in 1994 set up an Information Strategy Steering Group to investigate the potential for developing information strategies within HE, and to examine the ways in which guidance could be given to the HE community to help them draw up their own information strategies. An underlying motive, according to JISC (1998b), arose largely from a general feeling of dissatisfaction with the value-for-money being obtained from the large sums invested in IT. Research was then undertaken within UK HEIs which highlighted an interest in developing information strategies in HEIs. This resulted in the publication of the first version of the Guidelines for Developing an Information Strategy in 1995. This is reviewed in Section 3.5.
3.4 Documents on Information Strategy Development

To support the research in this thesis on information strategies at UK HEIs, over 50 published case studies, reports, and information strategy documents from JISC, and from over 20 HEIs, were collected and reviewed. The main ones are as follows:

*Information Strategies - An Executive Briefing (JISC, 1995a; JISC, 1998a); and The Guidelines for Developing an Information Strategy (JISC, 1995b; JISC, 1998b).*

Case study documents on JISC’s six pilot sites - *Developing an Information Strategy*: Information Strategy documents of the six pilot sites:

- *Information Strategy* (Bath Spa University College, 1998);
- *Towards an Information Strategy* (The Queen’s University Belfast, 1998);
- *Information Strategy - Working Paper* (University of Glamorgan, 1998);
- *Information Strategy* (The University of Glasgow, 1998);
- *The General Information Strategy* (The University of Hull, 1998);

Case study documents on JISC’s nine exemplar sites. These include:

- *Developing an Information Strategy* (Birkbeck College- The University of London, 2000);
- *Information Strategy* (The University of Northumbria, 1998);
- *Information Strategy* (Staffordshire University, 2000);
- *Information Strategy Pilot Project – Project Report* (The Open University; 2000);
- *Information Strategy* (Roehampton Institute London, 2000);
- *The Information Strategy Development* (Strathclyde University, 2000);
- *Information Strategy 2000/2001* (Writtle College, 2000);
• **Information Strategy** (Worcester University College, 1999).

Other relevant documents available during that period included: *Information Systems and Technology Management: Value for Money Study (HEFCE, 1998)*; Reports/papers on the development of Information Strategies at various HEIs; Key documents relevant to the development and implementation of the Information Strategy of the University of Hull, where a case study was conducted for this research.

Documents then available from the University of Luton seen as relevant to the research theme were also obtained and reviewed. These included:

- **Information Strategy** - Document of the University of Luton (2000);
- **Strategic Plan**;
- **IT Standards and Procedures**;
- **IT Strategy**;
- **IS Strategy**;
- **Teaching and Learning Strategy**;
- **The University Network**;
- **The Academic and Disciplinary Regulations for Students**;
- **Quality Assurance Handbook**;
- **Employment Handbook**; and
- Various procedural manuals on finance matters governing purchase of goods, and equipment and services.

In addition, a range of external policy documents affecting the operation of HEIs was also assembled. For example, documents relating to the various government Education and other Acts, including: *Information Security Act*; circulars and letters setting out the requirements of the University’s Funding Councils; the requirements of national quality assurance bodies; and other documents such as *Student Computing* (from JISC).

All the documents collected were reviewed in some detail, and valuable background information drawn for research into the development and
implementation of information strategies in HEIs. For example, a review of *Information Systems and Technology Management: Value for Money Study* (HEFCE, 1998), showed the following, to help set the work into context:

- A survey by HEFC of 19 UK HE institutions in 1997 revealed that 24% had an IT Strategy, 35% were in the process of drafting such a strategy, and 74% of the institutions had either an IS and/or an IT strategy. But there was no information on how many of the institutions were developing an information strategy.
- Few of the existing IS or IT strategies linked to the institution’s Mission Statement, nor to the overall objectives in the institution’s Strategic Plan.
- Though some institutions had identified the financial and physical resources of the central IS/IT function, none had set up a resource model for the institution’s IS/IT provision as a whole.

### 3.5 The First Version of Guidelines for Developing an Information Strategy

In 1995, the JISC Information Strategy Steering Group published its first version of the *Guidelines for Developing an Information Strategy* (JISC, 1995b). This takes the form of a *Preface*, an *Executive Briefing* and a *Practitioners’ Guide*. (*The Guidelines* is used in the following sections for short.)

The *Preface* opens with the message that “information is the lifeblood of HEIs. It is a resource and needs managing as such” (JISC, 1995b: 1). It goes on to comment that: “JISC is keen that institutions consider ways in which they can maximize the exploitation of the information resource”, and stresses: “an important tool to help achieve this is the preparation and implementation of an information strategy. Such a strategy considers information at the highest level and is not just concerned with technology-driven opportunities.”

The *Executive Briefing* is aimed particularly to the senior management of HEIs. It explains the value of an information strategy, and its relationship to institutional and other strategies.
The Practitioners' Guideline describes approaches and ideas, with checklists of relevant issues to be considered, saying that information underpins all the activities of FE and HE (JISC, 1995b). The type of information strategy the Guidelines attempted to produce was not just a document, nor was it concerned only with computing or libraries, they defined an information strategy as "a set of attitudes", and the Guidelines is a guide to a process intended to achieve (or at least partially achieve) those attitudes (Rothery and Hughes, 1997). The above authors stressed that an information strategy document was not the most important output of the information strategy; that should be the improvements in working practices throughout the institution. The recommended approach for institutions preparing their information strategies is broken up into six stages, as summarised in Table 3.1 below.

Table 3.1 Stages for Developing an Information Strategy (JISC, 1995b)

<table>
<thead>
<tr>
<th>STAGES</th>
<th>KEY TASKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Set up</td>
<td>To ensure top level commitment; To identify scope, and who is responsible for its development; To identify previous related information and other strategy resources for undertaking the work, and inform colleagues of the process.</td>
</tr>
<tr>
<td>2. Setting the context</td>
<td>To establish the context for the information strategy to operate; To identify the priorities, intentions, approaches to teaching, learning and research, and the challenges facing the institution and its development plans; To identify a route for the strategy to gain formal approval within the institution.</td>
</tr>
<tr>
<td>3. Defining Information needs</td>
<td>To define information groups within the scope of the information strategy, the development of standards for those groups and an infrastructure to deliver them. To identify gaps and problems with any of the groups and to design projects to solve them.</td>
</tr>
<tr>
<td>4. Defining Roles and responsibilities</td>
<td>To identify people with active roles and responsibilities – Information (Strategy) Committee, information (strategy) manager, information custodians, information users, information services, etc.</td>
</tr>
<tr>
<td>5. Implementation</td>
<td>To develop an understanding of the need for, and the essence of, an information strategy; To ensure that everyone within the institution is involved, to keep all colleagues up-dated as to progress; To identify projects to resolve issues and to plan for future implementation.</td>
</tr>
<tr>
<td>6. Monitoring and review</td>
<td>To check the effectiveness of the strategy; To assess the changing context and amend the strategy when necessary.</td>
</tr>
</tbody>
</table>
To test the Guidelines’ usefulness for developing information strategies at HEIs, in 1996 JISC selected and funded six institutions to act as pilot sites, which would adopt the approach outlined in the Guidelines and to share their experience with the HE sector. This process is outlined below.

3.6 Information Strategy Development at the Pilot sites

3.6.1 Introduction

The six institutions selected as pilot sites were: Bath College of Higher Education, the Queen’s University Belfast, the University of Glamorgan, the University of Glasgow, the University of Hull, and the University of North London (JISC, 1998b).

With the assistance of the JISC’s Information Strategy Co-ordinator who liaised and worked with the pilot sites, and arranged workshops where they could learn from each other, all the Pilot Site had produced their draft strategy documents within about one year (i.e. by 1997), including plans to implement projects in the coming year. Most institutions implemented a range of projects to deal with the information issues raised.

This section outlines the approaches of information strategy development adopted by these pilot sites. Note that the University of Hull is not discussed here as it is used as a case study in Chapter 9.

3.6.2 Bath Spa University College

This is a small HE College (approximately 2,500 students) with an emphasis on teaching. When it became one of JISC pilot sites, the strategic planning process had been well developed within the College. Following the practice of the Polytechnics and Colleges Funding Council (PCFC), the College followed a three-year cycle in which a ‘major’ plan was prepared every third year, and in the years between, the plan was updated. The last major plan had been
made in 1995, just at the point at which its IT Strategy and its associated expenditure were approved. That document indicated that the College intended to work towards the development of a comprehensive information strategy. The College’s participation in the JISC’s project provided useful impetus, and the 1997 updated Strategic Plan referred to the work done under its auspices, and to the pilot projects being implemented.

At an early stage, the College decided to take a ‘vision approach’ to the project, i.e. to start by considering what would be the distinctive characteristics of their institution if it had an effectively functioning information strategy. Four information groups were identified: teaching and learning, research, management, and administration. It was recognized that this was too broad a base but it was felt that it was preferable to be inclusive, rather than to risk omitting important issues.

Following JISC’s Guidelines, the College established a Steering Group, reporting to the Director and chaired by one of the Assistant Directors, to oversee the development of the strategy. The group was chosen to provide a mix of senior input and expertise covering the range of College activities and sites. It was composed of four senior managers, two academic staff with interests in innovative learning and teaching, and the Head of Publicity and Marketing. The group also quickly determined that a separate working party was not necessary, given the size of the College. The Quality Support Officer provided the administration with some clerical assistance paid for from JISC’s funding.

Six groups were set up in the form of workshops - two in teaching and learning, two in administration and one each in research and management, to identify information needs. In addition, the working party Administrator led a session with a group of research supervisors and Masters programmes coordinators. The groups were asked to think about their roles and responsibilities and the information they required to fulfil these, regardless of whether or not that information was currently or easily available.

Thus, the information required was collated, and three key areas were identified, as well as a number of smaller projects and several ‘quick fixes’. The three main areas were: teaching and learning, communication, and student details.
A number of projects were agreed in each of these key areas which were drawn from the list of strategic objectives, for example:

- Provision of internal and external electronic communication system.
- Provision of learning and teaching innovation; student access to, and facility with, independent learning resources.
- Development of an effective marketing and communication strategy.
- Improved staff access to, and use of, the Student Records System.
- Sharing of information about research initiatives and collaboration, information to assist management decision-making, and flow of information between senior management and staff.

3.6.3 Queen's University Belfast

Queen's University Belfast is a traditional teaching and research institution with over 12,000 students. It claimed in 1998 that 'information is the lifeblood of the University', and 'as a resource it must be exploited to its fullest extent' (Queen's University Belfast, 1998). The objective of this institution for having an information strategy was said to be the need to have a clear, accepted and efficient means by which information of all kinds is created, handled and used to support and deliver the aims of the university (Queen's University Belfast, 1998). To achieve this the project examined how information was used and how information could be used in support of research and teaching (i.e., the 'is' and 'ought' questions). It was stressed that an attitudinal change towards information and its use was an integral part of the information strategy implementation. This implied that the provision of a report was not the goal, but only a part of the goal. This was in agreement with JISC's objectives of information strategy development.

As one of the pilot sites, Queen's University received assistance from JISC's Information Strategy Steering Group. It also set up an Information Strategy Working Group of its own, which was under the direction of the Library and Information Services Committee.
The first stage of work was to educate staff about information (as opposed to IT), and to conduct an investigation into information use and information provision. By comparing the findings, the gaps and duplications were identified and information problems that had the most relevance to staff were prioritised.

Students on the postgraduate Information Management Programme undertook the work of information gathering. They considered such issues as: how information is used in support of research; how information is used in support of teaching; effective communication with students; perceived barriers to information flow; feasibility study of an Intranet for student records; the link between an information strategy and an information systems strategy; a 'gatekeeper' role in information transfer; information for total quality assurance and professional accreditation; and so on.

Existing information was collected from across the University, and contrasting sample sites from across the University were chosen to look at how information was used. The attitudes of senior staff were sought on information and responsibilities for information in the organisation. It was acknowledged that there was a need for an alignment of the university’s information, IT and work processes. Across the groups, the general issues that emerged included: a perceived lack of technical skill to make optimum use of technology; ‘islands’ of best practice; duplication and redundancy of information; frustration with central administrative information systems; and informal communication.

A number of interventions were also identified for the sample areas in the form of ‘quick-win’ projects. For instance: an education/training programme was devised to assist staff and students in the application of technology that was tailored to the needs of individuals and departments; and workshops were introduced to facilitate the dissemination of best-practice in managing information.

The interventions and their usefulness were monitored and written up as part of the recommendations of the strategy. The recommendation for medium term action was to streamline departmental and central processes to avoid the duplication of information stored. In addition, the importance of linking-in with
other areas of work already underway in the organisation was a valuable lesson learnt during the process of producing the strategy.

3.6.4 The University of Glamorgan

This is a post-1992 university with its emphasis on teaching, and with a number of associate colleges covering a wide area, with approximately a total of 15,000 students. The aim of its information strategy was to help address ‘conflicting demands and new technologies, to anticipate needs, and identify systems that fail as well as those that work, and to provide examples of good practice’. The university was looking to put in place advanced, user-friendly information systems and procedures to inform students and help staff adapt to and embrace a new world of learning.

The planning for a high quality, fit-for-purpose learning environment, which efficiently uses resources whilst securing the University’s mission and objectives was at the heart of the University’s information strategy development. The development of the strategy had a teaching and learning focus, informed by the objectives and priorities of the University’s Teaching and Learning Strategy. It was also intended that there should be a partnership focus, to include the university’s distinctive collaborative and franchising links with other education institutions and/or associated business organisations. The principal topic areas were identified as the production, acquisition, storage, use, and quality of information; as well as the use of technology.

Within teaching and learning, the operational activities of validation, planning and evaluation were chosen as being central, and an information analysis was conducted to gather a detailed set of data. Two of the university’s schools were chosen for the pilot phase.

Four half-day workshops were set up to elicit issues about information in teaching and learning with a variety of staff and students. These workshops provided a ‘grass roots’ picture of the ways in which information was utilised, created and shared. Some of the identified issues at the workshops were:

- Access to information and how much filtering is needed/desirable;
- Problems about communication with students;
• Lack of module descriptions and learning outcomes in the database;
• Staff development needs (from appraisals) not being implemented;
• Gaps in information flow across departments regarding student data.

The issues chosen by the project team for intervention were: transition to electronic information delivery, response to information trends, management and ownership, systems and processes, information overload and security. The ‘rapid response’ projects that were established were:

• Creation of a user-friendly but comprehensive module database, to assist student choice, as well as new programme development;
• ‘Closing the loop’ between the identification of staff development needs in appraisal and actioning them via the university’s training programmes;
• Ensuring that there was consistent means of obtaining, acting on, and reporting back on student module feedback; exploring the role of improving cross-departmental communication;
• Policies for the management of ‘electronic documents’; for managing the university’s information on the Internet; and for computer security.

In the evaluation it was noted that the workshop participants tended to focus on the ‘here-and-now’. In order to achieve the extra dimension of a future vision for the university, future-focused ‘think tank’ sessions were introduced and were ongoing. It was found that there was significant correlation between the information requirements of the pilot academic departments and the existing university initiatives. This provided confirmation that much of the necessary work could be incorporated into existing programmes. It also provided confidence that the university was already tackling issues that were of real relevance to the academic community. It was felt to be vital that the strategy remained a living procedure and did not lapse into just ‘another set of papers’.
3.6.5 The University of Glasgow

This is an old, devolved, research-based university with approximately 18,000 students. The thrust of the argument for the university's information strategy was that it 'should help everyone in the community – students, researchers, teachers, support staff, administrators and clerical staff', and contribute more effectively and minimise unnecessary bureaucracy. The fundamental objective of the strategy was to 'develop an Information Culture whereby the whole community would understand more clearly the issues and opportunities involved in the creation and discovery, processing and analysis, and retention and disposal of information' (University of Glasgow, 1998).

This university realised that the excessive supply of, and demand for information in the previous few years in a variety of media was set against a decrease of resources available to acquire and to manage that information. Therefore, it decided that one way to help improve such a situation was to make the best use of its resources through the development of a comprehensive information strategy. An information strategy should be an integral part of the university strategic plan, since it accepted that information in many forms "lies at the heart of teaching, learning, research and administration" (JISC, 1995b: 1). In view of the increasing importance of emerging technologies in supporting the above areas, the university agreed that an information strategy underpinned by suitable technologies might be the appropriate response.

Based on the Guidelines, a committee - the Information Strategy Steering Group (ISSG), was set up to develop the information strategy. The remit of the committee stated in 1996 that "the group will continue with the development of the strategy and monitor its implementation through the generation of new projects consistent with the strategy" (University of Glasgow, 1998).

The university started the information strategy development by focusing on a manageable number of information territories. Four issues were identified: information access, creative use of information in teaching and learning, effective use of current information systems, and bureaucracy. Seven projects were also identified. These were:

- Implementation of a new library;
• Provision of student-centred learning;
• Support for a flexible curriculum;
• Provision of student information;
• Provision of research management database;
• Provision of financial information in a devolved managerial environment;
• Improvement of records management.

The benefits of implementing the Information Strategy were identified as being: elimination of unnecessary duplication, exploitation of current initiatives, and release of time.

JISC’s Guidelines were initially followed, but later this university felt that these guidelines did not encourage as wide a level of participation across the institution as might have been desirable. Thus, the university re-examined the whole development approach and made a new start on a ‘holistic strategy’ using the experience gained in the project-based work. The university’s information strategy document was the result of this process, and it became an integral part of the university’s strategy for 1997-2001. In this the strategy document was seen as a “starting point in a dynamic process”.

3.6.6 The University of North London

This is another post-1992 university, and had approximately 13,000 students. The development of an information strategy was seen as a crucial means of “facilitating and consolidating change and providing a framework for communication and information flows within which academic, management and administrative systems could operate” (University of North London, 1998). The objectives of the institution’s strategy were to:

• Identify the key information needed to achieve the aims of the university’s Strategic Plan.
• Identify areas of (potentially) shared information where an information strategy is required.
• Establish an agreed code of practice for members of the university to adopt with respect to the treatment of information.

• Establish the quality standards required to ensure the information is ‘fit for purpose’.

• Identify the key roles and responsibilities required to operate and maintain the information strategy and to ensure commitment to it.

• Demonstrate the costs and benefits of the information strategy, including analysis of operations where appropriate.

• Define an implementation plan showing priorities and time-scales.

• Establish ways of monitoring the operation of the information strategy and to keep its various components under review.

Early on in the project a statement defining the information strategy was produced. A ‘Project Initiation’ document was also produced which set out the context of the project and clarified objectives.

An information audit questionnaire was then developed which was used as a basis for structured interviews. The data collected were used to produce detailed maps of information flows that highlighted issues relating to roles and responsibilities, waste and duplication of effort. In addition, interviews with members of the Steering Group highlighted the importance then given to management information, rather than to information that supported learning and teaching.

A staff development session was organised entitled ‘Implications for Teaching and Learning’ to raise awareness and address and issues of the information strategy. A number of implementation projects were specified, and the Steering Group prioritised those that would be funded.

3.6.7 Summary of the Approaches Adopted by the Pilot Sites and Critique

A general view of the approaches adopted by the pilot sites for their information strategy development is summarised in Table 3.2. As illustrated by the Table, all the pilot sites closely followed The Guidelines (JISC, 1995b) in the
development of their information strategies. They also all used JISC’s consultancy, and most attended JISC’s workshops. They all had a senior steering committee or its equivalent, and most carried out internal workshops or surveys to elicit information from staff at various levels, and sometimes also from students.

Table 3.2 An Overview of the Approaches Adopted by the Pilot sites
(Based on published documents on Information Strategy development from JISC)

<table>
<thead>
<tr>
<th>Pilot Site</th>
<th>Type of Institution</th>
<th>Student Number</th>
<th>Project Committee</th>
<th>Report to</th>
<th>Other Methods</th>
<th>Projects Identified</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Small HE College</td>
<td>2,500</td>
<td>A Steering Group, 4 other Groups</td>
<td>Board of Governors</td>
<td>Vision approach</td>
<td>5</td>
</tr>
<tr>
<td>B</td>
<td>Traditional</td>
<td>12,000</td>
<td>Working Group</td>
<td>Library &amp; Information Services Committee</td>
<td>Interviews &amp; discussions; Use of Postgraduates for information gathering</td>
<td>A few</td>
</tr>
<tr>
<td>C</td>
<td>Post-1992</td>
<td>15,000</td>
<td>A Steering Group; A Planning Group</td>
<td>The Vice-Chancellor</td>
<td>IS adviser, focus group, 4 workshops in 2 schools chosen for pilot sites</td>
<td>4</td>
</tr>
<tr>
<td>D</td>
<td>Traditional</td>
<td>18,000</td>
<td>A Steering Group</td>
<td>Information Services Committee</td>
<td>Target a few information territories</td>
<td>7</td>
</tr>
<tr>
<td>E</td>
<td>Post-1992</td>
<td>16,000</td>
<td>A Steering Group; A Task Group</td>
<td>The Vice-Chancellor</td>
<td>Structured interviews</td>
<td>A few</td>
</tr>
<tr>
<td>F</td>
<td>Traditional</td>
<td>18,000</td>
<td>Information Strategy Review Group</td>
<td>Policy &amp; Resources Committee</td>
<td>7 consultative workshops and 1.5 posts created</td>
<td>4</td>
</tr>
</tbody>
</table>

Key: A = Bath Spa University College  B = Queen’s University Belfast  C = The University of Glamorgan  D = The University of Glasgow  E = The University of North London  F = The University of Hull

Moreover, there seemed to be a real commitment within these sites to the notion of the wider context of an information strategy. As mentioned earlier, the Preface to the Guidelines had said that information is the lifeblood of HEIs; an information strategy “considers information at the highest level and is not just concerned with technology-driven opportunities”; and that such a strategy “is not just a document, [but] a set of attitudes” (JISC 1998b).
The HEIs seemed to agree with these views. The University of Glasgow (1998), for example, said that the fundamental objective was to develop an *Information Culture* whereby the whole community would understand more clearly the issues and opportunities involved in the creation and discovery, processing and analysis, and retention and disposal of information. Queen’s University Belfast (1998), as mentioned earlier, considered an attitudinal change towards information and its use as an integral part of the information strategy implementation. The other HEIs made similar statements.

The *Guidelines* referred to a ‘set of attitudes’ about information and said explicitly that the document was a guide to a process intended to achieve those attitudes, with the aim being “to change the working practices throughout the institution so as to enable it to achieve its mission more effectively” (JISC, 1998b). But as the review of the literature in Chapter 2 has shown, implementing systems in organisations is difficult, and needs full recognition to be taken of the human-centred aspects of the task. Here the *Guidelines* are perhaps deficient. Although there is encouragement for workshops and surveys (and indeed most HEIs carried out these to some extent), the general approach of the *Guidelines*, and the methods the HEIs used in following them, was of standard ‘top-down’, imposed, management. For example, Table 3.1 (Section 3.5 of this chapter) *Stages of Information Strategy development* includes the following sentences:

- To identify scope, and who is responsible for its development;
- To identify people with active roles and responsibilities – Information (Strategy) Committee, Information (Strategy) manager, information custodians, and so on.
- Implementation: ... To ensure that everyone within the institution is involved, to keep all colleagues up-dated as to progress and to encourage those resistant to the ideas promulgated.

All this sounds more top-down, hierarchical and management-driven, but less bottom-up, emergent and emancipatory. Moreover, it was well known that the universities had had problems in implementing previous systems. As mentioned earlier, Rothery and Hughes (1997) said that these universities’ willingness to
consider adopting information strategies arose "largely from a general feeling of dissatisfaction with the value for money being obtained from the large sums invested in IT" and this should have alerted JISC to the need for a more inclusive approach to system implementation.

On the plus side of organisational change, it was clear that some, maybe all, of the pilot sites were willing to look at the 'is' versus 'ought' aspects to information provision. As mentioned earlier, at Bath Spa, for example, the documents noted that: "the working party Administrator led a session with a group of research supervisors and Masters programmes co-ordinators. The groups were asked to think about their roles and responsibilities and the information they required to fulfil these, regardless of whether or not that information was currently or easily available"; while at Queen's University Belfast, "the project examined how information was used and how information could be used in support of research and teaching" (Queen's University of Belfast, 1998).

However, across the pilot sites, the general difficulties of implementing broad-ranging systems came into focus. As noted previously, general issues that emerged included a perceived lack of technical skill to make optimum use of technology; 'islands' of best practice; duplication and redundancy of information; frustration with central administrative information systems; and the need to depend on informal communication.

An interesting lesson came from the University of Glamorgan, relating to how effective 'emergent' policies might be encouraged, was that workshop participants tended to focus on the 'here-and-now'; and that in order to achieve the extra dimension of a future vision for the university, future-focused 'think tank' sessions had been introduced.

Other aspects of the information strategy development process at these pilot sites included: Bath Spa University College used a 'vision' approach to enable them to identify what it was the wished to achieve; Queen's University Belfast, overcame its initial difficulty with their committee structures, and also used post-graduates students to undertake some of the work involved; the University of North London achieved close links between their information
strategy and the strategic Plan for the institution; the University of Glasgow prioritised records management as part of their information strategy.

In summing up the experiences from the pilot sites, perhaps emphasis should be on the University of Glasgow, which noted that while the JISC’s Guidelines had been followed initially, the university later felt these did not encourage as wide a level of participation across the institution as might have been desirable. Thus, the whole development approach was re-examined, and a new start was made on a ‘holistic strategy’ using the experience gained in the project-based work, but avoiding detailed consideration of specific information.

3.7 The Revised Guidelines for Developing an Information Strategy

In light of the experience from the pilot sites, JISC’s Communications and Information Strategies Steering Group published a revised version of the 1995 Guidelines in 1998.

In the view of JISC, the original Guidelines had worked reasonably well at the pilot sites, although changes in emphasis were required. In particular, it was considered important to place more stress on the early stages, to ensure that the Institution is wholly committed to the development of an information strategy and that there is a common understanding as to what it is that they are trying to achieve (JISC, 1998b). In addition, the view was expressed that a reduction in the amount of detail required at the information defining stage would be beneficial, and that many had found the original Guidelines less than helpful as a working document. Major changes were therefore made to the structure of the document.

The new version of the Guidelines identified five stages (instead of six as in the 1995 version), comprising the framework for an information strategy. These are summarised in Table 3.3. Each stage in this new Guide begins with an introduction followed by the aims/outcomes of that stage, with suggested activities to undertake to achieve these. The structure of this new document was
said to be ‘far more practical’ (JISC, 1998a). With this new Guide, JICS intended to aid those actually working on their Information Strategy development.

Table 3.3 Stages for Developing an Information Strategy (JISC, 1998b)

<table>
<thead>
<tr>
<th>STAGES</th>
<th>KEY TASKS</th>
<th>DIFFERENCE FROM 1995 VERSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Getting started</td>
<td>Establish top-level commitment, set up committees, identify institutional priorities, understand the external context and plan the process.</td>
<td>Covers the contents in Stages 1 and 2, but without so much detail.</td>
</tr>
<tr>
<td>2. Information needs</td>
<td>Identify the area(s) to be examined and the methodology to be used, and identify needs, gaps and problems</td>
<td>Similar to Stage 3, but not as complicated.</td>
</tr>
<tr>
<td>3. Planning the implementation</td>
<td>Specify and prioritise projects, project management plans, raise awareness, and draft the information strategy framework document.</td>
<td>Covers similar area to Stage 5, but more concise.</td>
</tr>
<tr>
<td>4. Roles and responsibilities</td>
<td>Confirm and/or amend the committee structure and individuals responsible for the on-going maintenance of the information strategies, and specify individuals’ responsibilities for information.</td>
<td>Similar to Stage 4, but with the emphasis on amending the committee structure and individual roles as required.</td>
</tr>
<tr>
<td>5. Monitoring and review</td>
<td>Monitor the progress of the implementation projects, the effectiveness of the strategy, and the internal and external contexts, and review and up-date the strategy as necessary.</td>
<td>Same as Stage 6, but also stressing monitoring the progress of the implementation projects.</td>
</tr>
</tbody>
</table>

In addition, more specific changes were also made. For example, the first two stages were combined, as the experiences of the pilot sites had shown that they did not have to be followed chronologically. However, JISC (1998b) stresses that it is essential to ensure top-level commitment to the information strategy development throughout the process; and, at the outset really to understand the context within which the strategy is being developed and what is to be achieved.

‘Defining Information Needs’ became the main part of the process, but JISC, based on suggestions from one of its pilot sites, has removed the necessity to deal with the level of detail defined in the original Guidelines, and suggested three methodologies for this stage (see details in Appendix E):

1. Information analysis - identifying the broad processes undertaken by the institution and then breaking these down into sub-processes from which information needs and issues can be identified.
(2) Life-cycle analysis - found useful when used, for example, to examine students' information needs through their relationship with the institution.

(3) Information initiatives - using information initiatives which are already in hand within the institution and ensuring that the information strategy ethos is carried through them.

However, JISC suggested that these methodologies should not be considered to be exclusive, and that alternatives of other methodologies, and a combination of mixed methods, could be used. The 'Implementation' phase was changed into 'Planning the Implementation' and moved before the 'Roles and Responsibilities' stage (as defined in the 1995 Guidelines).

Another major change was to the format of the 'information pack', which is now a folder of documents containing: a revised Executive Briefing; a much shorter Practitioners' Guide (based on the checklists with suggested activities and advice on how to achieve each stage); a series of case studies (containing the six pilot sites' experiences); and an information and resources sheet (with suggestions of where to look for help or advice).

In the amended Executive Briefing (JISC, 1998a), JISC implies that the information strategy must flow from the institution's Strategic Plan, and help achieve the institution's mission by providing a link between the overall Strategic Plan and the operational requirements of the institution. As such, it is seen a tool for management, a means by which changes can be brought about, and attitudes and culture amended. It forms a central part of a hierarchy of strategies. It was felt that this message that had not been made clear enough in the original document. The aim was to provide a focus for information issues and a forum for a wide range of people to consider their institution's information needs.

The revised Guidelines (JISC, 1998b: 2) supported this, stating that 'the creation and use of information lie at the heart of a higher education institution's core functions of teaching and learning and of research'. The objective of having an information strategy, JISC (1998b) continued, was 'to have a clear, accepted and efficient means by which information of all kinds is created, handled and used to support and deliver the aims of the institution'. It went on to say that the main
activities within an institution - teaching, research and management, are all concerned with ‘the handling of information’. Thus, ‘it is information which is at the very heart of an institution providing the foundation for the development of knowledge and of understanding’.

JISC further stated in that the best way to think of an information strategy is “as a set of attitudes which underpin the way in which information is created, communicated, maintained, accessed and managed” (JISC, 1998a: 9). Rothery and Hughes (1997) also stressed that strategy should not be technology led but led by information users needs, and that information strategy should dictate the IT Strategy, not the other way around. It was to be expected that the process of developing an information strategy would be a tool for institutional change at a level outside the traditional scope of an IT/Computing Service.

Overall, in this new version of the Guidelines, JISC’s recommended approaches to HEIs intending to develop an information strategy were:

- To decide that an information strategy would be a valuable process to undertake.
- To agree the scope and coverage of the strategy.
- To determine the membership of the information strategy committee which will steer the process, chaired, JISC suggested, by someone of Pro-Vice Chancellor level.
- To decide who should have individual responsibility for taking the development forward.
- To establish the small team who will undertake the work to develop the strategy.

3.8 Summary of the Findings from the Empirical Literature

In this chapter, the ideas related to an organisation’s ‘strategy’ were first explored, with different views being expressed by various researchers. For example, Mintzberg’s debate on whether a strategy should be set up as a plan or as a pattern; Quinn’s distinction between ‘planned strategy’ and ‘incremental strategy’; and Johnson and Scholes’ planning framework for strategy. The review
showed that the traditional 'planned' top-down approach to strategy development is problematic, and has been challenged by 'emergent' bottom-up approach. This was followed by a brief discussion on information strategy, indicating that the issues of information management are frequently 'human' issues, calling for a human-centred view on strategic information management, and requiring as a result the study of social systems, and social theories.

Then the review turns to the empirical literature covering a range of documents directly related to the development and implementation of information strategies within UK HEIs, including: JISC Guidelines on Information Strategy Development, case study documents on five of JISC’s pilot sites, and reports/papers on the development of information strategies from various HEIs. Key findings include:

(1) The publication of JISC’s 1995 Guidelines on the preparation of information strategies ‘generated a great deal of interest and provoked debate at the highest management levels’. JISC’s recommended approach was generally welcomed. And, as can be seen from the sections above, in general terms, the first version of the Guidelines did work at the pilot sites, although changes in emphasis were later required. It was found necessary to stress the importance of the early strategy development stages “to ensure that the Institution is wholly committed to the development of an information strategy and that there is a common understanding as to what it is that they are trying to achieve” (JISC, 1998b). Even so, from the experience of the pilot sites, and as also recognised by JISC’s Information Strategy Co-ordinator, there was some degree of scepticism and general lack of understanding of what was meant by an information strategy as presented in the Guidelines.

(2) JISC’s Guidelines on implementing information strategies indicated that there was an acceptance of a need for wider participation in the process. For example, one of the pilot sites (The University of Glamorgan) which followed JISC’s Guidelines later found that it did not encourage a wide range of participation across the university as they thought desirable, and their information strategy approach was re-examined, and a new start was made on a ‘holistic strategy’ using the experience gained in the project-based work.
The Guidelines had a strong bias towards a 'planning approach' for information strategy development. This tension between planning and participation is the problem identified by Mintzberg and others in the corporate strategy domain, and by the soft systems thinkers in organisational analysis (See Chapter 3). This strengthened the view that evaluating information strategies from a social viewpoint was likely to yield valuable findings.

The diverse nature of the HE community has meant that The Guidelines did not prove to be of equal value to all institutions. In addition, even though JISC offered a great deal of useful advice, the fact that the costs of a full strategy implementation are considerable mean that an HEI that has developed a strategy may still find it too expensive to proceed to full implementation.

Importantly, it was also found that liaison by JISC largely did not continue with the pilot sites due to resource and financial constraints. It would probably have made the implementation of the information strategies more effective if JISC had continued to assist, monitor, and evaluate progress to help implement the projects defined in the HEIs information strategy documents.

Overall, the review of both the theoretical and empirical literature showed that while there has been considerable research about IT strategy and IS strategy, and some research on the wider issues of information strategies, in terms of information strategies specifically designed for HEIs virtually the only published literature has been that from JISC and from a limited number of authors closely related to JISC's initiatives.

In terms of the empirical literature reported here, two things stand out. Firstly, these JISC documents incorporated little in the way of theoretical grounding. Secondly, although many UK HEIs have now developed information strategies, so far there have been few attempts to measure the success and effectiveness of the strategies that have been developed. JISC had the original intention of doing so, but the difficulties in conducting such an evaluation caused them to abandon the effort. The research reported here is therefore a partial response to this situation, in that it sets out to develop a framework for assisting the evaluation of information strategies at HEIs. This framework is described in the next chapter.
CHAPTER 4

THE DEVELOPMENT OF A FRAMEWORK BASED ON RELEVANT THEORETICAL AND EMPIRICAL LITERATURE
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RELEVANT THEORETICAL AND EMPIRICAL LITERATURE

4.1 Introduction

Theoretical concepts related to information strategy development at HEIs have been set out in Chapter 2, and practical experience, mainly from the JISC community, has been presented in Chapter 3. This chapter takes the topic forward by generalising a framework for supporting the evaluation of information strategies as implemented at HEIs. The framework proposed is constructed from practical, theoretical and philosophical perspectives drawn from empirical and theoretical literature.

There are five sections in this chapter. Section 4.2 outlines the overall approaches used in constructing this initial framework. Section 4.3 describes a three-stage process for building the proposed framework. Section 4.4 gives a description of the framework and presents the framework itself diagrammatically in Figure 4.7. and in tabular form as Table 4.6. Finally, Section 4.5 is a chapter summary.

4.2 General Approaches for Building the Framework

Based on the material discussed in previous chapters, the framework is to be generated using the following:

- Incorporation of both theory and experience;
• Embedment of critical systems thinking ideas;
• Appropriate use of participative research;
• Appropriate levels of aggregation and disaggregation;
• Feedback and iteration.

These approaches are now briefly explained.

4.2.1 Theory and Experience

As outlined in Chapter 3, developing and implementing an information strategy involves consideration of a wide range of human and technical aspects. For many of these aspects there already exists an extensive literature. The framework, therefore, needs to be able to direct the evaluator of an information strategy to the relevant theories in the literature. The framework also need to take account of the available practical experience, and it does this by supporting each of its evaluation elements with the relevant empirical results. Note that this linking of evaluation topics to both specific underlying theory and accumulated practical knowledge is an explicit intention of the framework.

4.2.2 Critical Systems Thinking

In this thesis, as the reader is by now aware, the ideas of Critical Systems Thinking (CST) are held to be a powerful approach to the proper analysis of complex systems, of which an information strategy is but one example. In particular, the aim here has been to incorporate the ideas of CST into the evaluation framework. Specifically this has involved taking account of the three commitments of CST: critical awareness, where this involves the investigator aiming to uncover and understand the full social complexity of a situation; theoretical and methodological pluralism; and emancipation (improvement), including organisational factors such as human-centred issues, hierarchy, power and coercion.
4.2.3 Participative Research

Participative research, while not strictly part of CST, can be a very useful adjunct. Having the investigator involved in an intimate way in the problem situation with the people, experiences and controversies can provide a direct way for discovering more subtle aspects of the situation, including those to do with perception, motivation, and issues of power and control. In the evaluative framework, attention has therefore been paid to incorporating suggestions that investigations be carried out in a participative manner for those elements of the framework where this is appropriate and possible. As will be seen later in Chapters 6 to 9, the empirical research carried out in this study has made significant contribution to formulating the final evaluative framework. Three out of the four pieces of this research have been of a participative nature. For these the investigator was closely involved with the people in situations defined as problematic. For example, to investigate the Student Records System (SRS), the researcher acted as a system user and for two weeks worked side by side with other users, making observations, having conversations or discussions with workmates and conducting interviews into real problem situations. And to understand the process for information strategy development, the researcher managed to attend all the decision-making meetings held by the Information Strategy Steering Group of the university investigated.

4.2.4 Aggregation and Disaggregation

Within the framework, the information strategy evaluation process has been broken down into three broad categories, and these are then further divided into specific ‘evaluation elements’ (see Table 4.6, and Figure 4.7 in Section 4.4). Consideration of the elements within the framework raises the very general problem of how much to aggregate or disaggregate the components of a system under investigation. This problem is discussed, for example, by Checkland (1981a) in his development of ‘Soft Systems Methodology’ as applied to information systems development. Disaggregation allows one to look at the pieces of the puzzle in detail, but often the problem is with the puzzle as a whole.
Effort has been made here to make the 'disaggregated pieces', i.e. the individual evaluation elements, as powerful as possible, looking, for example, at broader areas such as 'external environment', and 'organisational culture', rather than at 'the information strategy in the library', or 'does the Student Records System need updating?'. But even so, the evaluator must always be aware that division of a problem may be suspect, as it can mask wider issues.

4.2.5 Feedback and Iteration

Finally, in the process of generating the evaluation framework the need for feedback and iteration is clearly recognised. Hence the initial version of the evaluation framework, presented as Figure 4.7 in Section 4.4 of this chapter, is subsequently examined and re-examined via a sequence of empirical investigations (namely, a piece of action research, two ethnographies and a case study), and the resulting feedback from each piece of the empirical research is incorporated into each of the corresponding revised versions of the framework (see Chapters 6 to 9).

4.3 The Process of Building the Framework

4.3.1 Introduction

This section presents a four-stage process for generating the proposed framework. Stage One (Section 4.3.2) presents the 'control structures' of the framework by drawing information from JISC's Guidelines (see Chapter 3) and its pilot sites and exemplars for information strategy development. Stages Two and Three (Sections 4.3.3 and 4.3.4) deal respectively with the 'external and internal environment analysis' of the framework by drawing ideas from organisation and management theories (see Chapter 2). Stage Four (Section 4.3.5) summarises the Critical Systems Thinking (CST) ideas that are to be embedded in the framework - by focusing on critical awareness, pluralism, and emancipation.

In the above sections, the framework elements are described under the following headings:
• 'Theoretical Perspectives'
• 'Empirical Evidence'
• 'Guidelines for Evaluation'

Note that not all these headings are used for every element, as the evaluator is sometimes simply directed back to the relevant section of the theoretical or empirical literature. And sometimes, where warranted, a longer explanation of the linkage of the framework to the literature is given.

These sections lie at the heart of the information strategy evaluation, as they not only described the process of the framework building, but also gives guidelines for implementing the framework and provide a 'practitioner's manual' showing how each of the framework elements can be used in a real-world situation.

4.3.2 Framework Development Stage 1 - The Control Structures

Theoretical Perspectives

As related to an HEI's information strategy, 'control structures' are the formalised management structures the HEI uses to prepare, plan, develop, implement, monitor, and review its strategy. For theoretical support for the 'control structures', insights are gained from a combination of Clarke's (2001a) *Framework for Information Systems Strategic Management* and Johnson and Scholes' (1993) three elements for strategy planning - *Analysis, Choice, Implementation* (Figure 3.3).

Clarke (2001a), having analysed information systems (IS), corporate strategy, strategic alignment, and competitive advantage from the viewpoint of CST, points to a re-conceptualisation of IS strategic management as a human-centred domain, and the findings from the analysis have provided a new approach to IS strategic management. It is assumed that this general approach translates to the wider domain of management of an information strategy.
Empirical Experience

As mentioned earlier, this stage concerns the control structures of the framework. In Chapter 3, we looked at the empirical evidence from JISC and its pilot sites case studies. For information strategy development at HEIs, JISC recommended six steps - preparing, planning, developing, implementing, monitoring and reviewing. These control structure steps had been used by 6 pilot sites and 9 exemplar sites chosen by JISC for information strategy development. This sequence of steps proved useful, although adjustments were also made to fit the different problem situations at different HEIs.

Figure 4.1 Framework Development Stage 1 - Control Structures
These steps are adapted and illustrated in Figure 4.1 below. In the ‘Control Structures’ proposed here, it is stressed that an ‘Interim Review’ between stages is important, as the feedback from such reviews can allow problems to be solved as soon as they arise to ensure the success of the development and implementation of the information strategy.

Each of these steps of the control structures in Figure 4.1, in turn, is composed of a range of components. Drawing from JISC’s Guidelines (Sections 3.5 and 3.7) and the work of JISC’s pilot sites (Section 3.6) and exemplar sites for information strategy development, these components are summarised as follows:

Key components for Step 1 - Preparing Process
- Analyse Context
- Review the strategic plan and mission statement
- Identify needs for having an information strategy
- Establish top level commitment
- Establish a committee or working groups
- Consider employing a co-ordinator

Key components for Step 2 - Planning Process
- Identify areas for investigation
- Identify methods to be used
- Consider having a specialist, and/or an external consultant
- Make plan for the development
- Work out a timetable

Key components for Step 3 - Developing Process
- Plan projects
- Establish quality standards required
- Define an overall methodology
- Conduct SWOT analysis (strengths, weaknesses, opportunities and threat)
- Confirm top management approval
- Allow incremental/emergent decision-making
- Make discipline for submitting reports at set times
- Draft the strategy
- Get approval of the document

**Key components for Step 4 - Implementing Process**
- Distribute the document
- Establish multiple implementation plans
- Define the roles and responsibilities
- Allocate information resources for implementing and maintaining the strategy
- Develop other strategies - collaborative projects
- Establish the set of attitudes to the management of information

**Key components for Step 5 - Monitoring Process**
- Identify ways of monitoring the operation of the strategy
- Identify costs and benefits of the strategy

**Key components for Step 6 - Reviewing Process**
- Regular review of the strategy
- Respond to the changing environment
- Continuously assess and update the strategy
- Plan for the future

The six steps contain a wealth of details, and should serve the evaluator as a 'check-list' for questions relating to the control structures. For 'is', as opposed to 'ought', questions, the evaluator will need to read the university's appropriate procedure documents for each of these activities in order to find out what has been planned, and, if possible, what has actually been done, in the various areas covered.

**Guidelines for Evaluation**

It is unlikely that the evaluator will need to examine all the points in each of the six steps in detail. Instead he/she could try to address the wider question of how successful, or otherwise, the information strategy has been, and ask questions
more critically to help identify the reasons for this success or failure. If failure is the case, questions on what ‘ought to’ have been done will certainly need to be asked.

For example, if Step 5 – the Monitoring Process has been implemented, initial information on the success or failure and costs and benefits of the information strategy should be available. The evaluator can then try to narrow the situation down by asking, if failures have occurred, in which stage or stages has this been. For instance, if it is determined that in Step 4 - the Implementation Process attitudes to the management and handling of information did not alter as anticipated, the evaluator then can ask such questions as: ‘Is this the fault of the roles and responsibilities that were established (also in the Implementation Process) or the wrong identification of the needs of the information strategy right back in the Step 1 - the Preparing Process?’

If the causes for the failures are identified, then the question becomes what ought to be done to avoid such failures in future. For example, was it because of the lack of motivation of those responsible for the implementation, or because of unbalanced decision-making owing to suppressed voices on the part of the powerless, or perhaps because of the inappropriate methodology used? If intervention can be made, then the evaluator should consider which methodologies are available, and how to select between them, in order to improve the problematic situation.

4.3.3 Framework Development Stage 2 - The External Environment Analysis

This stage is described in two sub-sections – external environment and competitive advantage. As part of the proposed framework, this stage is illustrated diagrammatically as Figure 4.2.
A. External Environment

Theoretical Perspectives

In terms of analysing the external environment, Chapter 2 has reviewed the work of Campbell et al. (1999) who liken an organisation's external macro-environment to the skin of an onion (see Figure 2.4). Johnson and Scholes (1993) presented the issue of matching an organisation's capabilities to the environment, and showed that the following are of importance:

- assessing the nature of the environment;
- auditing environmental influences;
- identifying key competitive forces through structural analysis;
- analysing the competitive position; and
- identifying key opportunities and threats.

As far as an HEI is concerned, the external environment of an information strategy is taken to comprise those factors that impinge on the strategy, but are outside the direct control of the institution itself. That is, the external environment relates not only to factors that are 'off-campus', but also to pressures, trends and developments on-campus that impact the strategy, if they are beyond the HEIs control.

Section 2.6.1 also discussed the PEST model (political, economic, socio-demographic, and technological), which is widely used for analysing the complexity of an organisation's external environment. For an HEI, political
environment influence may include education legislation and policies (such as the recent topic of university 'top-up' fees), education initiatives, government funding limits, health and safety requirements, and so on. The *economic* environment of an HEI centres on changes in the macro (global) economy and their effects on the institution and its 'consumers' - the students. The *social* environment requires an HEI to understand the potential impacts of society and social changes on the institution (e.g. student numbers coming forward for particular courses, other universities' student recruitment criteria, and policy changes social changes in other countries that could affect potential students) and its potential markets. The *technological* environment is currently having major effects on all sections of an HEI and its activities. The fast-changing nature of IT has had a great impact on the provision and extraction of information, especially in terms of the increasingly intensive use of the Internet, and in terms of distance-learning technologies which have made e-education possible and accessible. Other recent external challenges may include at least the following:

- the growing competition between HEIs for home and overseas students, and also for research funding; this is especially relevant in the light of the prospect of continued selectivity by research funding bodies following the Research Assessment Exercises (RAE);
- the political agenda for UK higher education;
- the changing balance in HEIs between public and private funding.

All such factors need to be thought about rationally to determine their likely impact on the information strategy being developed.

*Empirical Evidence*

HEIs frequently have to adapt to external pressures. Currently, for different reasons, including the need to respond to the increasing competition and wider participation, the general situation is to move away from the traditional teacher-centred learning and teaching and move towards student-centred learning. It is recognised that information technologies have a central role to play to support these changes, but it should also be recognised that the growing reliance upon IT
might not be cost-effective, not only in terms of hardware and software, but also when essential technical support and staff development are taken into account.

In terms of information strategy development, JISC (1998b) states that internal and external environments are important. However, it is not only the broader aspects of the external environment, such as those mentioned above that are important. A university also needs to consider the ‘micro-external environment’. For example, the HEMIS (Higher Education Management Information Systems) initiative introduced a Management Information System to some UK universities, including the University of Luton. It was a factor outside a university’s direct control, but played a big part in the university’s system development (e.g. the Student Records System). It may be that a critical analysis of the possible impact of this external factor on the university’s business could have led to a strategy being adopted that was more robust to such outside pressures.

Guidelines for Evaluation

The main items to be evaluated, therefore, centre on the procedures the HEI uses to take account of the external environment for the formulation of its information strategy. This includes both the mechanisms employed for making the analysis (for example, PEST and SWOT), and the range of factors considered worthwhile analysing. Indicative factors include: governmental policies (e.g. levels of funding, increase in tuition fees), anticipated rise or fall of student numbers - both home and overseas (e.g. because of the increased competition in higher education community), technology trends (e.g. consideration of adequate investment in updating IT equipments and staff training), behaviour of ‘competitors’ (both UK and abroad) in higher education (e.g. increasing provision of e-education).

In carrying out the evaluation, the evaluator will seek to determine the extent that consideration of the external environment has had on the success or otherwise of the information strategy as implemented. If the information strategy has run into problems, or achieved less than was expected of it, the evaluator then has to find out: Was this due to a failure to anticipate the impact of some external
factor(s)? If so, the evaluator's key task is to seek to determine if some alternative approach to incorporating potential changes in the external environment into the formulation of the information strategy might have achieved better results.

**B. Competitive Advantage**

*Theoretical Perspectives*

An organisation's success, to a large extent, depends on its competitive position relative to others in the same sector. For commercial organisations, competitive advantage is often seen as the overall purpose of a business strategy. Essentially, the business can be said to possess competitive advantage if it is able to return higher profits than its competitors. The higher profits mean that it will be able to commit more retained profit to reinvestment in its strategy, thus maintaining its lead over its competitors in the industry.

From the part of view of an HEI, the term 'competitive advantage' may seem somewhat remote. But all HEIs are in fact competing to attract more and better-qualified students, more research grants, public support and having a sounder overall academic and financial position compared to 'rival' providers of higher education. In particular, HEIs need to decide which range of courses they wish to offer to distinguish their university from others. Therefore, proper management of information is likely to lead to competitive advantage over competitors within the higher education community.

Porter (1980) offered a 'Five Forces Model' (see Section 2.6.5) for conducting a formal industry analysis which is more in depth than simply looking for trends and general industry information. Although this model is geared to competitive advantage overall rather than just competitive advantage from information, it can be adapted for developing better information strategies, as the analysis can provide insight into solutions for tackling the competitive external environment. In this model, Porter explains that there are five forces that influence what happens within the industry, where these are set out in more detail under 'guidelines for evaluation' below. In addition, Earl (1989) discusses the use of business strategy frameworks. These frameworks can be adapted by an HEI to
provide an overall method for analysing and managing its competitive position in respect of information.

In terms of the information resource of an organisation, Clarke (2001a) points out that an organisation clearly stands to gain from the strategic use of information. Sustainability of an organisation comes from the interaction of interdependent sub-systems within a system of human activity: this kind of competitive advantage is not planned for in any instrumental sense, but is the natural outcome of information which is strategically managed. Clarke’s research points to significant questions concerning whether organisations can plan to gain competitive advantage from the implementation of information systems. He points out that competitive advantage seems to derive, not from the technology or systems themselves, but from the way in which they are used (Clarke, 2001a).

**Empirical Evidence**

It appeared that the question of competitive advantage was not considered explicitly in either the JISC’s information strategy studies, nor within the specific research carried out within the selected universities for this study. However, the concept is implicit in the general notion of seeking to improve an organisation’s provision of information, and thereby competitive position versus other providers of higher education who are in competition for students and resources.

**Guidelines for Evaluation**

As mentioned above, to assess whether an information strategy has been developed that will gain competitive advantage, we can use Porter’s model to identify if the five forces have been considered in the information strategy as implemented. In relation to HEIs, the five forces can be explained as follows:

- Competitors – other HEIs that offer the same courses, services, or information as your university.
- Potential new entrants: The new institutions entering the higher education that may offer the same courses, services, or information as your university.
• Customers: Students and potential students who come to take courses at your university or at one of your competitors.

• Suppliers - Those institutions/companies (such as colleges, agencies, overseas education authorities) that supply your university with the students and/or services offered on your campus.

• Substitutes - Other means and sources for the same courses, services, or information as your university provides.

Using these explanation for the five forces, we get a clearer picture of the ‘business’ environment in which an institution competes. This analysis only borrows Porter’s forces to lend structure. His analysis goes beyond the information gathering and cursory analysis explained here. By utilizing Porter’s strategic methods we can gain a clearer picture of the university environment, resulting in sounder information strategies.

In terms of carrying out an evaluation, as explained above, ‘competitive advantage’ is a subset of ‘external environment’, and so the evaluator should ask the same type of questions as apply to the former, e.g.:

• What forces affect the university, and how will these change over time?

• How can these forces be influenced?

• What are specific opportunities and threats for the future?

• Has the institution monitored the competitors’ (other HEIs) strategies, activities and performance? If not, what ought to be done about this?

• Were aspects of competitive advantage being formally considered when developing the institutional information strategy?

• If so, what methods were used?

• If not, why not? What could have been different if these had been taken into consideration?
4.3.4 Framework Development Stage 3 - The Internal Environment Analysis

By contrast with analysis of the external environment, analysis of an organisation’s internal environment may provide the management with a sound understanding of how the organisation is operated, how effective its current strategies are, and how effectively it has deployed its resources in support of these strategies. In recent years, organisations have given greater emphasis to internal analysis because research has suggested that it is predominantly the actions of the organisation itself which determine its ability to perform.

Organisations may carry out an internal analysis for various reasons. In terms of developing an effective information strategy, an organisation needs to analyse its overall ways of providing and using information, particularly from the point of view of identifying procedural or cultural weaknesses that need to be addressed in developing such a strategy or implementing it.

The information strategy elements to be discussed here under the heading of 'Internal Environment Analysis' include:

A. Organisational Structure
B. Organisational Culture
C. Resource Management,
D. Information Needs Analysis
E. Strategic Alignment
F. Management of Strategic Change
G. Evaluative Structures

As a third component of the proposed information strategy evaluation framework, this stage (Stage 3) is illustrated diagrammatically in Figure 4.3.
A. Organisational Structure

Theoretical Perspectives

It will be recalled that organisational structure relates to the *formal* interpersonal arrangement and responsibilities an organisation puts in place to carry out its activities. The general theory relating to this is set out in Section 2.6.2.

In devising an information strategy that will work, it is clear that this has to relate to the type of organisational structure in place. Take two extreme cases: if the organisation is a military body where orders are always obeyed (at least in theory), then one type of information strategy might be appropriate; if the organisation is a small ‘commune’ of self-motivated workers, then quite a different strategy would be appropriate. Clearly, most HEIs lie somewhere between these extremes, and it is up to the strategy managers to decide what type of organisation they have (or perhaps *ought* to have) so as to arrive at an information strategy that is workable and can be supported across the HEI.

An HEI is normally made up of organic teams, with liaison groups affecting progress in an environment that used to be relatively stable, but is becoming less stable now. In such a structure, formal information systems which regulate and control are perhaps less important than systems which allow information and decision processes to flow flexibly and informally.
Empirical Evidence

In terms of the organisational structure, an HEI ought to address its structure by taking into account of such issues as those rising from the rapidly changing environment. Such issues may include:

- competition in the global educational market;
- moves away from traditional pedagogical approaches to new educational paradigms;
- development of high-speed and broadband networks;
- changing roles for staff, in particular lecturers;
- assessment of resources needs;
- efficiency gains needed to increase the student-staff ratio (for example, re-structure the institution by necessary staff redundancy).

To address these issues, many HEIs have re-organised their divisions related to communication and IT. For example, in some institutions, libraries and computer centres have been merged to form a central unit which is often called 'Library and Information Services'. In others, 'Learning Resource Centres' have replaced libraries and computer centres. In doing so these institutions have made use of their staff's time more effectively and rationalised support for student learning experience.

However, it is recognised that in practice (also see organisational culture below) university members have a great deal of autonomy, and frequently can frustrate initiatives sent down from the top. JISC (1998b) noted, for example, that in some places incorporation of 'user' views was weak, pointing to a need to see a university structure as more than simply hierarchical or mechanistic.
Guidelines for Evaluation

The evaluator should seek to determine the extent to which organisational structure has been taken into account during the development of the HEI's information strategy. A subsidiary question to ask is then: if the organisational structure was not fully taken into account, would doing so have improved the resulting information strategy?

Answering the first question is probably fairly straightforward: Did a formal part of the information strategy planning include an analytic look at how control is delegated and how decisions are taken within the HEI? If so, how was this analysis carried out, and how was it used?

To answer the second question is harder, but may be necessary. If no organisational structure analysis was carried out, or in the evaluator's opinion, was misleadingly done, did this have an impact on the success of the information strategy? This can be discovered by focussing on the implementation of the strategy, and asking if problems that arose could be traced to the HEI not understanding its own procedures for devolving power and decision-making.

B. Organisational Culture

Theoretical Perspectives

By contrast with organisational structure, organisational culture deals with those aspects, often unspoken and undocumented, of an organisation that determine how activities are actually carried out. This covers such things as which decisions are taken and which are overlooked; who really takes these decisions; what power managers and others possess; who is pulling their weight and who is slacking; how people feel about the organisation and their jobs; and a host of similar attitudinal characteristics that determine how the organisation actually performs when faced with its real-world tasks (see Section 2.6.3 for additional perspectives).

One of the important facets of an information strategy is to instil a 'culture' into the HEI that information is important, and needs to be generated accurately and used wisely if the HEI is to flourish. Thus it is important to plan
and implement an information strategy in terms of the organisation’s culture and the required cultural change.

Currently available evidence points to a need for the internal environment to be viewed in both structural and cultural terms, with, in Clarke’s view (Clarke, 2001a), an over-concentration on structure at the expense of culture giving rise to tensions which prove difficult to resolve.

Empirical Evidence

Johnson and Scholes (1993) drew up a ‘cultural web’ for a UK bank. The categories of this ‘web’ have been expanded and adapted here to reflect the ‘culture web’ of a UK university, see Table 4.1 below.

Table 4.1 ‘Cultural Web’ of a Specific UK University

<table>
<thead>
<tr>
<th>Overall Paradigm:</th>
<th>Symbols:</th>
</tr>
</thead>
<tbody>
<tr>
<td>The organisation aims to:</td>
<td>- ‘Letter/brochure phrases’</td>
</tr>
<tr>
<td>- Be indestructible</td>
<td>- Logo</td>
</tr>
<tr>
<td>- Provide for society’s good</td>
<td>- Traditional, hierarchical titles</td>
</tr>
<tr>
<td>- Educate and understand</td>
<td>- Type of language: ‘Please ensure that ...’ not ‘you must ...’; ‘Your advice would be appreciated...’ not ‘Tell me ..’</td>
</tr>
<tr>
<td>- Be not-for-profit</td>
<td></td>
</tr>
<tr>
<td>- demonstrate professional status</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Routines:</th>
<th>Organisational Structure:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Aim for professional, polite, and rather formal inter-personal and inter-department communication</td>
<td>- Hierarchical</td>
</tr>
<tr>
<td>- ‘Follow the procedures’ rather than get the problem solved</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Control Systems:</th>
<th>Power Structures:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Faculty management under central control</td>
<td>- Deans and Pro-Vice Chancellors led by Vice Chancellor</td>
</tr>
<tr>
<td>- Standardised procedures</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Stories:</th>
<th>Rituals:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- ‘Over 70 employees are going to be made redundant’ (2001)</td>
<td>- 3-term academic year</td>
</tr>
<tr>
<td>- ‘Disaster’ of the Student Records System’</td>
<td>- Induction week</td>
</tr>
<tr>
<td>- ‘Students owe the university over 8 million pounds tuition and accommodation fees’ (2001).</td>
<td>- Inter-semester assignments</td>
</tr>
<tr>
<td>- ‘3 key members of the management team are given a no-confidence vote’ by the university union.’</td>
<td>- Term-end examinations</td>
</tr>
<tr>
<td></td>
<td>- Graduation ceremony</td>
</tr>
</tbody>
</table>
The entries in this table are based on the empirical literature, this author's own knowledge, and findings from the empirical research described in Chapters 6 to 9. Such a 'web' can help in identifying culture factors that can affect the success or otherwise of implementing an information strategy. As JISC (1998b) noted, in this context, there was a need to move to a more inclusive, participative culture.

Guidelines for Evaluation

In evaluating organisational culture, an evaluator needs to consider the organisation's history and myth (core beliefs of the institution, including its past strategies, legitimised behaviour, etc.); its leadership and management styles, and employee expectations; and its structure and systems, e.g. individuality versus collaboration.

The evaluator should make an effort to discover if the HEI's organisational culture had been thought about when developing the information strategy. If so, the evaluator should find out how the culture was assessed, and how this was incorporated into the plans for the information strategy. If not, the evaluator needs to determine what is the HEI's organisational culture, and then think about possible impacts that the existing culture could have had on the information strategy.

C. Resource Management

Theoretical Perspectives

In much of human enterprise, resource management is key. To successfully implement a strategy for change almost invariably requires some use of the organisation's resources, with available resources needing to be allocated in such a way that the overall implementation of the strategy is optimised. Theory in this area is given in Section 2.6.4 of Chapter 2, which includes the resource assessment framework of Campbell et al. (1999); Johnson and Scholes' (1993)
approach to resource planning and Porter's (1990) value-chain concept (Figure 2.5).

**Empirical Evidence**

Many projects of all sorts in HEIs have failed due to inadequate provision of resources. Presumably because of this, the Information Strategy Committees of many HEIs have referred to the importance of resources in supporting strategy development. However, in practice, most of the information strategy developments are resource-constrained. JISC (1995b and 1998b) reported that lack of resources is often a problem, including, for example, not using people of a high enough level to take the responsibility for developing such a strategy. The experience of some of JISC's pilot sites and other HEIs show that partly because of the other responsibilities of their Information Strategy Co-ordinators, the time allocated to, and the effort made on the formulation of the information strategy was limited. This, to some extent, reflected the fact that the top-level of some HEIs organisational hierarchical structure did not pay adequate attention to the information strategy development of their institutions, even though people at lower levels involved in the development might have thought that such attention was important. This reflects again on aspects of power and coercion within the organisation.

**Guidelines for Evaluation**

In analysing resources, the need is to consider issues such as resource capability (the absolute amount available to use); resource balance (at right time and in the right place); outside resources (links to internal through the 'value chain'); the committees established (at what level, and with what competencies); the budget for the time required; the budget for the costs involved; and the technical and financial resources actually employed.

More specifically, for example, the evaluation of resources used in the generation of an HEI information strategy might involve the institution being requested to provide details such as the number of people directly employed at the
various phases of the development, implementation and operation of its information strategy. So an evaluator could ask questions such as:

- Were human resources in the institution allocated or reallocated?
- Were new positions created?
- Were job descriptions rewritten?
- Were new duties assigned to existing staff?
- Was there training for existing staff?

Regarding technology resources, questions such as follows should be asked:

- Was technology used as a means of implementation of the chosen information strategy?
- Were new technologies chosen specifically for the information strategy, or were existing technologies adapted?
- What technologies were most useful to this case?
- Were training opportunities provided to help staff develop their IT and information management skills to the levels required for effective performance of their duties and responsibility?
- Did the HEI provide programmes of study that include the enhancement of students' information literacy?
- Did the university keep information technology and information systems under constant review, and exploit technological advances in HE context?

In terms of the exploitation of new technologies, an evaluator needs ask:

- Did the HEI encourage innovative developments based on the new technologies, such as enabling access either from the users' home PCs or public workstations?
- Did the institution encourage its staff to take advantage of innovative models of electronic publication and resource provision?
If the answers to the three sets of questions above are 'no', then the evaluator should ask 'why not'; followed by 'ought to' questions, asking 'what would have been different' if such issues related to resource management had been considered. The information gathered must then be augmented by the evaluator attempting to discover the relevant degrees of motivation, involvement, and expertise of the people involved using ideas informed from critical systems thinking.

In addition, the evaluator can check if the HEI has a website which provide its users with accurate and timely information in an easily navigable form, and whether measures have been put in place to ensure consistency of the information provided, avoidance of information duplication.

The evaluator may also wish to find out:

- If the HEI has sought to protect its information resources from security problems that could otherwise have an adverse impact on its operations and professional standing.
- If the university has a policy for records management that includes the management, archival and disposal of vital electronic records as well as paper-based records.

Again, if the answers are 'no', then 'why not?' questions should be asked, followed by an critical analysis of the information gathered.

An evaluator may also need to consider issues related to financial resources, without which neither human nor technology resources can be allocated. Questions to be asked might include:

- How were financial resources of the institution allocated or reallocated to implement the chosen information strategy?
- What financial practices were employed? Were these approaches appropriate?
- What financial effects have been felt as a result? If the effects were negative, what could have been different?
Normally it is easy for people to think of technology as an ‘information resource’. However, technology is only one of the many resources that an institution can bring to help implement an information strategy. An evaluator may wish to consider the mix of resources used by a HEI when it is implementing its information strategy. Questions to be asked might include:

- What choices were made among the use of people, technology, money, policies, etc. in implementing the information strategy?
- Were there specific trade-offs, where one resource was substituted for another, or where limits in one resource area increased the cost in another?
- Were some resources essential while others could be substituted for?
- What general observations might be offered about the allocation of resources in the information strategy project?

If various resources are not thought to have been allocated or reallocated appropriately, what could be done to get the allocation right?

D. Information Needs Analysis

Theoretical Perspectives

An information need can be defined as the type, quantity and quality of information which a person or group requires within a certain period of time to complete certain tasks (Wigand et al., 1999). However, the above authors also point out that in many cases an information need can only be vaguely defined. Above all the need depends on the underlying task, the objectives and the psychological properties of the information user. Thus, while it is probably generally true that an HEI will carry out at least its initial information needs analysis in a rather prescriptive way, effectively assuming total knowledge of who needs what information and for what purposes, the definition of actual information needs can be expected to be a difficult matter, and likely to require an iterative process with initial false steps being followed by sounder views over time.
Moreover, the real situation of 'what information is needed by who' is likely to be more complex still, as pointed out by Clarke (2001a) who indicated that in the general context of an organisation's information system, since information ... must be drawn from various parts of the organisation, the determination of information needs will be a highly participative process, demanding a human-centred approach.

That is, the information needs analysis constitutes, fundamentally, an 'ought' question, and must consider a wide range of social aspects of the people who generate, distribute and use the information within the HEI if their motivation, understanding, imagination and co-operation are to be effectively employed in generating a valid analysis of the information needs within the institution.

Empirical Evidence

Defining an HEI's information needs is a key aspect of the process of information strategy development. As JISC (1998b: 11) points out in its 'Practitioner's Guide', "this stage will form the major part of the development of the information strategy". This view is underlined in the Guide's 'Suggested Timetable' (JISC, 1998b: 21), where JISC allots by far the major part of its work of developing a strategy to information needs analysis. In addition, JISC (1998b: 11) notes an important secondary aspect of defining information needs is that "... this stage of the process should have a significant impact on the spread of awareness of the essence of the information strategy [within] .. the institution."

This following section draws mainly on information from JISC's work on information strategy, but also on this researcher's involvement in JISC's workshops in the area and the action research in a HE institution. Details of this is given in Chapters 6 and 8.

Since information needs analysis lies at the heart of an HEI's information strategy, it should also be a major focus in the evaluation of that strategy. The evaluation of information needs should consider if the strategy has met the information needs of the various groups of people within the university, including
all academic and support staff, all students, the academic and professional communities served by the university; and national, government and other external agencies.

However, as mentioned previously, the provision of HE in the UK currently faces a number of significant changes. These include: increasing student numbers; changes in intake standards; decreasing resources in some cases; increasing demand for flexible degree provision; teaching quality assessments, research assessment exercises (RAE), and other reporting/monitoring requirements; rapid increase in electronic data; and increasing competition from other HEIs, both in the UK and abroad. An information needs analysis should therefore be broad-based enough to take account of the information pressures brought about by these changing elements in the environment.

JISC (1998b: 11) says that the purposes of the information needs stage are, “primarily, to identify the information needs of the institution (or at least the prioritised parts of it) and to identify any issues surrounding these needs - i.e. needs which are not being met.” The HEIs, at the outset, must establish a methodology and a project plan for identifying information needs. As mentioned Section 3.7 in Chapter 3, three main techniques were suggested by JISC (1998b) which can be useful to produce a logical analysis of the processes undertaken in an HEI - a functional approach, a life-cycle approach, and an information initiatives approach. However, as warned by JISC, the practitioner should not regard these methodologies as exclusive (also see Appendix 3.1).

As can be seen from these techniques, while much of information needs analysis consists of detailed examination of data requirements for specific tasks, the analysts also must not forget the wider perspective. Examples include:

- The need to recognise that changes are underway. (Some of these changes have been listed earlier in this section; examples of two others, the move to course modularity and the provision of ‘full lecture notes’, are discussed in Table 4.2.)
Table 4.2 Examples of Issues Affecting Information Needs

<table>
<thead>
<tr>
<th>Modularity (vs. standard courses)</th>
<th>Request for full lecture notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Advantages</strong></td>
<td></td>
</tr>
<tr>
<td>- Easier for students to pick</td>
<td>- Lecturers have to think through and</td>
</tr>
<tr>
<td>wider range of study, and areas</td>
<td>prepare their lectures carefully;</td>
</tr>
<tr>
<td>of interests;</td>
<td>- Good for students who miss odd</td>
</tr>
<tr>
<td>- Easier for part-time students</td>
<td>lectures;</td>
</tr>
<tr>
<td>to do modules when convenient.</td>
<td>- Essential for distance learning</td>
</tr>
<tr>
<td></td>
<td>students;</td>
</tr>
<tr>
<td></td>
<td>- Easier for HEFC Quality Assessment</td>
</tr>
<tr>
<td></td>
<td>teams to judge course content.</td>
</tr>
<tr>
<td><strong>Disadvantages</strong></td>
<td></td>
</tr>
<tr>
<td>- Exams at end of modules and</td>
<td>- Much more work for the lecturers;</td>
</tr>
<tr>
<td>no year-end or three-year end</td>
<td>- May constrain some lecturers to</td>
</tr>
<tr>
<td>exams that tests all knowledge</td>
<td>create more ‘pedestrian’ lecture notes;</td>
</tr>
<tr>
<td>gained;</td>
<td>- May tempt students to miss lectures</td>
</tr>
<tr>
<td>- Difficult to ensure correct</td>
<td></td>
</tr>
<tr>
<td>pre-cursor courses are taken.</td>
<td></td>
</tr>
</tbody>
</table>

- The need to look at information provision outside the HEI, not just within. (Some of these ideas are listed in Table 4.3).

Table 4.3 HEIs Communication to the External Environment

<table>
<thead>
<tr>
<th>Communicating information about the institution’s strategies, activities and performance to general public through:</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Planning and organisation of media communications;</td>
</tr>
<tr>
<td>b. Monitoring and control of media coverage;</td>
</tr>
<tr>
<td>c. Design and production of official publications;</td>
</tr>
<tr>
<td>d. Design and management of the web.</td>
</tr>
<tr>
<td>Liasing with local community to promote productive links with the institution, for example:</td>
</tr>
<tr>
<td>a. Monitoring the local economy and job market;</td>
</tr>
<tr>
<td>b. Monitoring and participating in local initiatives which provide learning opportunities for staff and students;</td>
</tr>
<tr>
<td>c. Providing support and assistance to local organisations and institutions.</td>
</tr>
<tr>
<td>Liasing with student representative bodies</td>
</tr>
<tr>
<td>Participation in government programmes</td>
</tr>
<tr>
<td>Reporting on performance to funding councils, government departments and other authorised bodies.</td>
</tr>
</tbody>
</table>
Interesting 'ought' questions such as the following can be asked:

- How much of the new information technology is considered as appropriate for students?
- Are students simply learning how to 'cut and paste' their essays from on-line resources, rather than how to use these resources to achieve creative learning.

(Under JISC's auspices, a study at the university chosen for the Action Research of this study is conducting an investigation into the extent that 'cut and paste' information from the internet and other sources is being presented by students as their own work.)

*Guidelines for Evaluation*

The information strategies developed by JISC’s pilot sites, implicitly or explicitly, expressed the following facts:

- All members of a university should have access to the information they need to carry out their duties in teaching, research, and other programmes of study effectively.
- Information should be accessible in an appropriate way and available with minimum delay.
- Information ought to be available freely to members of the university unless there is good reason for it to be restricted.
- The university also ought to make available appropriate information to external stakeholders, including prospective students, current and potential research partners and the local or regional community.

Questions an investigator should aim to answer include those listed in Table 4.4 below:
Table 4.4 Information Needs Analysis: More Questions and Answers

<table>
<thead>
<tr>
<th>Questions to ask</th>
<th>Means of finding the answers</th>
</tr>
</thead>
</table>
| - How was the information needs analysis carried out?  
- What resources were used in the analysis, and what was the time-scale?  
- What techniques for analysis were used?  
- What theoretical background supported the methods selected? | Answers to these questions will mainly come from interviews with the HEI personnel responsible for developing and implementing the information strategy (knowledge elicitation). Findings from the interviews may imply that other approaches, especially participative ones, for information needs analysis could have produced better results for the information strategy. |
| - How well has the needs analysis succeeded?  
- Were adequate information items included, and in sufficient detail?  
- Has key information been missed?  
- How well has the strategy for identifying these information items actually succeeded?  
- Has the strategy been followed in practice; and has it produced the desired results?  
- Has the information system been designed with due regard to users who have limited direct access to networked information sources? | Answers to these questions will require detailed discussions, and perhaps need expanded 'round-table' type workshops, with the participation of not only the strategy implementers, but also the relevant information generators and users. For these type of questions, one should not necessarily expect clear or focussed answers, and the investigation techniques should be broadly structured to reflect this. |
| - Is it possible to carry out a critical analysis to suggest reasons for the successes or failures for those areas where the strategy has succeeded, and for those where it has been felt not to? | Answers to this question will essentially be provided by the investigator, drawing on his/her knowledge to probe and challenge the approaches adopted by the HEI. The underlying aim here is to see if other needs analysis paradigms might have offered better, or more directly applicable, results. |

In making this analysis the investigator will want to be clear about the systems and boundaries he/she will want to consider, being explicit about who should be dealt with, and who ‘ought’ to be involved and affected. In this context, the paper by Midgley and Brown (1998) can be consulted.

In addition, an evaluator should also be aware that while the university is trying to meet the needs of its users, it should also be aware of the legal issues surrounding information access\(^1\).

Table 4.5 lists key information an institution needs for teaching, learning, and research, which the evaluator may choose to focus on.

---

\(^1\) Relevant legal documents HEIs need to observe include: Protection Act, the Freedom of Information Bill and the Copyright, Designs and Patents Act.
Table 4.5 Key Information Needed for Teaching, Research and Management

<table>
<thead>
<tr>
<th>Information types</th>
<th>Users</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Teaching</strong></td>
<td></td>
</tr>
<tr>
<td>- Lecture notes; textbooks;</td>
<td>- Students (wherever they are);</td>
</tr>
<tr>
<td>- Methods of assessment;</td>
<td>- Academic staff;</td>
</tr>
<tr>
<td>- Ways of organising and presenting knowledge to existing and potential students, eg. course design, networked support;</td>
<td>- Administrative staff;</td>
</tr>
<tr>
<td>- Collaboration with other institutes in the provision of course content.</td>
<td>- Externals such as HEFC, Q/A teams, etc;</td>
</tr>
<tr>
<td>- Students (wherever they are);</td>
<td>- Everyone who expresses an interest.</td>
</tr>
<tr>
<td><strong>Research</strong></td>
<td></td>
</tr>
<tr>
<td>- Research equipment (libraries, computing, web, database, CD-ROM, processing capacity...);</td>
<td>- Researchers;</td>
</tr>
<tr>
<td>- Research funding.</td>
<td>- Lecturers;</td>
</tr>
<tr>
<td></td>
<td>- HESA; HEFCE.</td>
</tr>
<tr>
<td><strong>Management</strong></td>
<td></td>
</tr>
<tr>
<td>- Student records;</td>
<td>- Vice-chancellor; Pro-vice chancellors;</td>
</tr>
<tr>
<td>- Staff training and development;</td>
<td>- Deans; Dept. heads;</td>
</tr>
<tr>
<td>- Well based, consistent and monitored information for decision making;</td>
<td>- Managers;</td>
</tr>
<tr>
<td>- Payroll/Pensions;</td>
<td>- Lecturers;</td>
</tr>
<tr>
<td>- Accounts and Finance;</td>
<td>- Students;</td>
</tr>
<tr>
<td>- Records of buildings, equipment, maintenance;</td>
<td>- Perspective students;</td>
</tr>
<tr>
<td>- Methods of monitoring and evaluating;</td>
<td>- HESA and HEFCE;</td>
</tr>
<tr>
<td>- Support of information resources and services.</td>
<td>- Other users.</td>
</tr>
</tbody>
</table>

**E. Strategic Alignment**

*Theoretical Perspectives*

In putting together its information strategy, an HEI will wish to ensure that this is aligned with, and builds upon, strategies for information technology and information systems that may already be in place. Section 2.6.6 looks at aspects involved in achieving an effective synthesis between these strategies, highlighting the work of Henderson and Venkatraman (1993) and Smits et al. (1997). Relevant models are illustrated in Figure 2.7 and Figure 2.8.

*Empirical Evidence*

Section 3.4 outlined the findings by the HEFCE’s survey ‘Information Systems and Technology Management Value for Money Study’ (1998). Clarke (2001a) also summarises the key findings of this study as follows:

- Few institutions have a formal information strategy;
• Most have a formal *information systems* and/or *information technology* strategy;
• Few IS or IT strategic plans cover the use of IS or IT throughout the institution;
• Few IS or IT strategic plans link the use of IS or IT to the institution’s overall strategic objectives;
• Some institutions have identified the financial and physical resources of the central IS or IT function, but none have a resource model for the institution’s IS or IT provision as a whole.

In this context, JISC reported that its participants for information strategy development often saw information and IT as synonymous. There is thus a need not only to align strategies, but also for HEIs to have a well-developed view of what each strategy actually covers.

At a JISC conference in London in 2001, a presenter from Sheffield University gave a speech on information strategy in HE. He suggested that a model (*Figure 4.4*) be used to link an institution’s strategies.

![Figure 4.4 Linking Strategies](based on notes taken at the conference)

In this research, this model has been adapted to cover the wider question of strategic alignment of an information strategy. The revised model (*Figure 4.5*) reflects that the communication and information technologies (C & IT) are
important, as they both have become an essential element of institutional information strategy. In Dearing (1997), C & IT are described as technologies which enable the processing, storage and transmission of both live and recorded information by electronic means. Regarding the role of C & IT in HEIs and in the general management of information, Dearing (1997) recommends that it is essential for a information strategy to be well integrated in the institutions overall operational structure and their overall forward and development plans, and they must offer reliable support at all levels of the institutions. The success of an information strategy depends largely on the confidence with which it is accepted and owned by individuals. As indicated in Figure 4.5 the revised model places information strategy at the centre of the diagram, where it is linked to all other strategies.

![Figure 4.5 Align Information Strategy with other Strategies](image)

**Guidelines for Evaluation**

Strategic alignment, in the sense used here, means making sure the proposed information strategy "aligns" with (i.e. is in agreement with, and supports) the organisation's wider corporate and other strategies. A couple of simple examples may help clarify this. Supposing the university decides it wants to concentrate on teaching, and have only a small presence in terms of research,
then it makes no sense if the information strategy seeks to secure access to a wide range of research journals. Or suppose the university’s overall strategy includes recruiting a high proportion of overseas students, then the information strategy must ensure the university’s course details are in places likely to be seen by its potential students from overseas, and in form that is clearly understood by them.

Incidentally, it is only fairly recently that HEIs have tended to have explicit written organisational strategies, and maybe some still do not. Having such strategies written down makes the process of seeking alignment easier. But it is still possible to examine alignment even if the corporate ‘strategy’ is only implicit, i.e., not formally documented, but is a general ‘understanding’ held in common by senior administrators and staff. Needless to say, alignment is not just a one-time process: an effective information strategy will need revising regularly against the organisational corporate strategy.

**F. Managing Strategic Change**

*Theoretical Perspectives*

For an HEI to implement an information strategy, where none existed before, represents a strategic change within the organisation. It will involve manpower and resources and certainly will involve changes, perhaps major ones, in the ways that certain activities within the HEI are carried out.

Like all other major changes within organisations, this can be carried out well or badly and raises complex issues of how such a change should be managed. As Section 2.6.7 sets out, several types of analysis exist to help identify how changes can be brought about. The work of Mintzberg and Westley (1992) and Johnson and Scholes (1993) are examples. These insights can be used to examine and evaluate the approach adopted by a specific HEI to manage the change in implementing its information strategy.
Empirical Evidence

The experience of the university where the action research was conducted in managing change in its Student Records System, for example, was that there was an over-emphasis on operations, a lack of long-term vision, and the human issues were not adequately addressed. Where there were changes to an existing system, this points out the hazards in managing any strategic change.

Guidelines for Evaluation

The key question the evaluator must ask is: what approach for introducing strategic change did the HEI adopt in introducing its information strategy? The range is very broad, as Chapter 2 indicates, so the evaluator should assess the formal and informal steps taken to manage this change, and ask whether these helped or hindered the strategy implementation.

G. Evaluative Structures

Evaluative structures are those structures that an organisation puts in place to help it evaluate the strategy it has implemented, or is implementing. For example, an evaluative structure might be a committee that is set up to report at regular intervals on the effectiveness of some facet to an information strategy, or it might be some semi-automatic feedback process from data users that aims to report on their satisfaction, or otherwise, of the data provided.

Such evaluative structures overlap the 'control structures', part of the evaluation framework (Stage 1) presented earlier in this chapter, and each should help and support the other. But the evaluation framework is intended to be both more broadly based and more inquisitive than the normal evaluative structures, putting a critical perspective on the general question of how well the strategy has been operating.
Guidelines for Evaluation

JISC’s Guidelines (1998b) contain a stage on Monitoring and Review. Some of the recommendations cover straightforward progress report type monitoring, for example, checking that projects are keeping to the timetable though some do look somewhat deeper, for instance, “to monitor attitudinal/cultural changes within the institution. Is there a growing awareness and understanding of information as a resource and a greater willingness to share it within the institution?” (JISC, 1998b: 19). The task is also set ‘to evaluate the effectiveness of the information strategy’; but with few specifics about how such an evaluation might realistically be carried out.

So it is quite possible for an information strategy to have no formal evaluative structures. It is all too common for some management initiatives to be introduced, and for the management to ‘walk away’ from the issue, putting in place no mechanism to monitor the effectiveness of the initiative introduced.

Where such evaluative structures exist, the investigator will need to assess:

- Effectiveness (i.e. user satisfaction) - is this measured or not?
- Projected results – have these been evaluated or not?
- Were the main issues and value-added activities addressed?
- Were any crucial areas missed?
- Were any key pieces of evidence accountable for success or failure?
- Was there any summary of the evaluation, and recommended improvements?

However, as mentioned at the start of this section, the evaluator, in practice, is unlikely to cover all the issues that might be evaluated, and so she/he will need to focus and narrow the evaluation, but also think about the rather wider questions such as:

- How is the actual or proposed strategy to be judged?
- How is it known that one strategy is better than another?
4.3.5 Framework Development Stage 4 - Critical Systems Thinking

**Perspectives**

**Theoretical Perspectives**

As mentioned earlier, the ideas of Critical Systems Thinking (CST), which are underpinned by critical social theory, are held to be a powerful approach for the development of an evaluative framework for information strategies. That is why Chapter 2 has given a rather detailed descriptions of critical social theory and CST (see Sections 2.3 and 2.5). For this study, effort has been made to incorporate the key CST ideas into the evaluation framework, in particular paying attention to CST's three commitments of critical awareness, pluralism and emancipation. The steps for embedding CST into the framework are amplified in Figure 4.6, and discussed in greater detail under 'Guidelines for Evaluation' below.

**Empirical Evidence**

The research community has become increasingly aware that many activities involving significant human interaction, such as in this case the investigation of how HEIs develop their institutional information strategies, are likely to be successful only if they are properly informed by human-centred aspects, including involvement and consent, power, hierarchy, and emancipation. The evaluation framework developed in this thesis therefore attempts to direct the evaluator to a clear consideration of these issues. Specifically, many of the problems identified in the empirical parts of this research related to planning approaches to information strategy development gaining precedence over alternative methods (Clarke, 2001a). Thus the evaluation framework seeks to pay specific attention to areas where planning approaches (in the sense of 'top-down', functionalist, prescriptive approaches) may give less optimal results than the use of more 'emergent' design processes. However, the degree of success of such a viewpoint can only be discovered by evaluations carried out in practice.
## Figure 4.6 Framework Development Stage 4: Key Aspects of Critical Systems Thinking

<table>
<thead>
<tr>
<th>CST Aspects</th>
<th>Informed by*</th>
<th>Requirements</th>
<th>Methodologies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Critical Awareness</strong></td>
<td>Kant</td>
<td>Understand and reflect on people’s actions in terms of their background, perceptions, and motivations.</td>
<td>Qualitative inquiry methods informed by social theory:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Understand implicit assumptions and limitations of inquiry methods used.</td>
<td>- Identifying boundary conditions.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Asking is and ought questions.</td>
</tr>
<tr>
<td><strong>Pluralism</strong></td>
<td>Habermas</td>
<td>Uncover people’s types of knowledge:</td>
<td>Use different methods to access different types of knowledge.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- technical</td>
<td>- Empirical-analytic inquiry</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- practical (human interaction)</td>
<td>- Historical hermeneutic inquiry (see below)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- emancipatory.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Analysis via multiple social theories</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Application of appropriate intervention methodologies</td>
<td>E.g. SSM, SOSM, TSI, CSH, IS strategic management. Use of methodology selection frameworks.</td>
</tr>
<tr>
<td><strong>Emancipation</strong></td>
<td>Habermas &amp; Foucault</td>
<td>Uncover where power hinders standard approaches to problem solving. Who has the power? Is this deciding the truth? Ought the power structure be changed?</td>
<td>Role-play, critique of ideology and discourse, assumption analysis; encourage radical change.</td>
</tr>
</tbody>
</table>

* For the main ideas of Kant, Habermas and Foucault, refer to Table 2.2 in Section 2.3.5.
Guidelines for Evaluation

As indicated in Table 4.6, CST’s three commitments are respectively informed from the three critical social theorists discussed in Section 2.3: Kant, Habermas and Foucault. Critical awareness is informed from Kant’s question ‘how do we know’. According to Kant, we can only arrive at our idea of truth through our own experiences, and we all have different experiences. If you are going to deal with any problem it is no good just looking for ‘the truth’ about the problem (i.e. objective reality), as we must expect different people to have arrived at different versions of the truth. So solving any complex human problem must take into account the different views.

As Table 4.6 makes clear, this requires that the inquiry methods that are used to help uncover and resolve a problem must be those that access people’s perceptions of the situation, and which look closely at the background, thought processes and motivations that lead people to take the actions that they do. Such inquiry methods include critical observation (looking at people’s actions, but informed by knowledge of social theories), interviews, discussion groups and various categories of participative research and case study. It is intended within the framework that these enquiry methods be applied to all of the elements within the framework (Sections 4.3.2 to 4.3.4), as appropriate, to uncover the reality of the participants’ perceptions.

Critical awareness also covers the notion of understanding the strengths and limitations of the inquiry methods used. Thus, while a discussion group is aimed at understanding individual’s perceptions, the information obtained may in turn be influenced by issues of power and coercion within the group. Many similar examples of the limitations of any one inquiry method can be given, and it is the evaluator’s responsibility to keep these in mind when electing to use one or another technique.

Pluralism, informed by Habermas, studied the question ‘how do we act in life’. In Habermas’ view, people act differently at different times to fulfil the three ‘cognitive interests’ – technical, practical and emancipation. So the need is to use
different methods to uncover different types of knowledge that motivate the various behaviours shown by people. As Table 4.6 shows, the inquiry methods to uncover the types of knowledge range from simple empirical/analytic approaches if the knowledge is essentially ‘technical’; through hermeneutic inquiry to understand the interaction between the participants of the situation; to more involved approaches, such as role-play and assumption analysis, where issues of power are involved. Again, these inquiry methods can be brought to bear on all of the various framework elements included within ‘control structures’ and ‘environmental analysis’, as appropriate, that are involved with the operation of the HEI’s information strategy.

In CST, pluralism is taken also to refer to pluralism of social theories consulted, and of intervention methods employed. Here Table 4.6 (and reference back to Chapter 2) lists some of the theories and approaches that can be brought to bear on the problem situation under consideration. In particular, when considering a choice among competing intervention methodologies one of the several methodology selection frameworks outlined in Chapter 2 can be utilised.

*Emancipation* is informed by both Habermas (discussed above) and Foucault. While Habermas examined power from perhaps a too-simplified viewpoint, the ‘ideal speech’ situation, Foucault investigated power and knowledge in rather more depth. In his view we need to find out: Who is powerful? Who has power? Who determines what is ‘true’? To do so, we need to critique the ideology and discourses that are in operation; to analyse existing assumptions on power; and, if necessary, consider interventions that involve significant (i.e. radical) changes in who holds the power.

The three critical social theories discussed above talk about different aspects, but they all contribute to putting a CST view into the evaluation process. Taking these main viewpoints of CST into account in the case of evaluating an information strategy it is not adequate to identify what has been done (the ‘is’ of the situation), the evaluator must also have a mental viewpoint, and a set of tools, that enables him/her to address the question of what ‘ought’ to have been done (see Ulrich in Section 2.5). Likewise, the evaluator must have enough knowledge
and experience to propose appropriate theories and methodologies that are applicable to the situation encountered.

### 4.4 A Synthesised Framework

Each of the previous four sub-sections have described certain elements of the proposed information strategy evaluation framework, and thus has focused on building part of the intended evaluation framework. Here these are synthesised into the full 'initial framework', which is shown in Figure 4.7. This diagram has combined the four parts of the framework developed in the stages of Sections 4.3.2 to 4.3.5, and as shown pictorially in Figures 4.1, 4.2, 4.3 and 4.6.

Note that this 'initial' framework, as presented here, has itself gone through three prior revisions. The original version was presented at the UKSS International Conference in York (Bentley et al., 2002), and was revised in light of constructive comments made at one of the conference workshops. The second revision took account of additional suggestions from the supervision team of this research and was incorporated in a paper presented for the 3rd European Conference on Research Methodology in Business and Management, held in Reading (Bentley, 2004). The third revision has been done after the thesis viva and has incorporated key feedback from the thesis examiners. In particular, in this version of the framework the CST ideas are more explicit.
<table>
<thead>
<tr>
<th><strong>CRITICAL SYSTEMS THINKING IDEAS EMBEDDED IN THE FRAMEWORK ELEMENTS</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Critical Awareness</strong></td>
</tr>
<tr>
<td>Understand people's perceptions.</td>
</tr>
<tr>
<td>Understand limitations of inquiry methods.</td>
</tr>
<tr>
<td><strong>Awareness</strong></td>
</tr>
<tr>
<td>Understand limitations of inquiry methods.</td>
</tr>
<tr>
<td><strong>Pluralism</strong></td>
</tr>
<tr>
<td>Types of knowledge: - technical - practical - emancipatory</td>
</tr>
<tr>
<td>Use of multiple social theories</td>
</tr>
<tr>
<td>B &amp; M's paradigms, critical social theories, organisational theory.</td>
</tr>
<tr>
<td>Use of appropriate intervention methodologies.</td>
</tr>
<tr>
<td><strong>Emancipation</strong></td>
</tr>
<tr>
<td>Who has the power? Is this deciding the truth?</td>
</tr>
</tbody>
</table>

---

Figure 4.7 *An Initial Framework for Supporting Information Strategy Evaluation in HEIs (Amplification in Table 4.6)*
In summary, as illustrated in the diagram, the framework centres around four key inter-related areas of an HEI's information strategy on which the evaluator needs to focus:

(1) The general ‘control structures’ used within the university for preparing, planning, developing, implementing, monitoring, and reviewing the strategy.

(2) The degree that the strategy takes account of the university’s ‘external environment’, including its ‘competitive advantage’.

(3) The degree that the strategy takes account of aspects of the university’s own ‘internal environment’, including organisational culture and structure, resource management, information needs analysis, strategic alignment and management of strategic change.

(4) The inclusion of CST approaches into all the above areas, drawing the evaluator’s attention to the need for methods of inquiry, analysis and intervention that incorporate CST’s guiding principles of critical awareness, methodological and theoretical pluralism, and emancipation. Note that the latter aims to allow an organisation to maximise the potential of each of the individuals within the organisation, in part by understanding the limits to this potential as set by the organisation’s existing structures of power and coercion.

In terms of the specific framework elements listed under the above broad categories, it is recognised that other choices may have been made, but the aim has been to select elements that are generic in nature and relate to well-defined areas of theoretical and empirical information (as reviewed in Chapters 2 and 3) from which the evaluator can draw insights.

Table 4.6 shows the main theoretical perspectives and empirical evidence reviewed in Chapters 2 and 3 that are used to support each of the framework elements of Figure 4.7. It is intended to help an evaluator more easily identify and access these relevant theoretical aspects and empirical evidence when he/she evaluates an information strategy as implemented in a HEI.
<table>
<thead>
<tr>
<th>Framework Element</th>
<th>Theoretical Perspectives (Based on Chapter 2)</th>
<th>Empirical Evidence (Based on Chapter 3)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CONTROL STRUCTURES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prepare, plan, develop, implement, monitor, and review</td>
<td>Strategic planning (Gallier, 1991); Planned and incremental strategies (Mintzberg, 1987; Quinn, 1980); &quot;Is' and 'ought' (Ulrich, 1983); SoSM (Jackson and Keys, 1984); Jackson, 1987b); TSI (Flood and Jackson, 1991b); Strategic implementation (Johnson and Scholes 1993); Mixing Methods (Clarke, 2001b)</td>
<td>The Guidelines (JISC, 1995, 1998); Contents covered at JISC Workshops; JISC's pilot sites experience, e.g. University of Hull</td>
</tr>
<tr>
<td><strong>EXTERNAL ENVIRONMENT</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environment analysis</td>
<td>Value chain/five forces (Porter 1990); Survey of the environment (Johnson and Scholes 1993); Environment analysis (Campbell et al; 1999); PEST model, SWOT analysis</td>
<td>JISC (1998b): &quot;Internal and external environments are important.&quot;</td>
</tr>
<tr>
<td>Competitive advantage</td>
<td>Five forces (Porter 1980); The strategic advantage to be gained from information (Porter 1990)</td>
<td></td>
</tr>
<tr>
<td><strong>INTERNAL ENVIRONMENT</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organisational structure</td>
<td>Four views (Jackson, 1987a); Basic organisational structures (Johnson and Scholes, 1993); Mechanistic to adhocratic (Mintzberg et al. 1998); Metaphors (Morgan, 1986); Four paradigms (Burrell and Morgan, 1979)</td>
<td>A JISC’s pilot site changed its organisational structure in correspondence to the changed environments. This has facilitated the process of implementing its information strategy.</td>
</tr>
<tr>
<td>Organisational culture</td>
<td>Four paradigms (Burrell and Morgan, 1979); Politics, philosophy, culture (Foucault, 1988); Cultural web (Johnson and Scholes, 1993); General discussions on organisational culture (Pettigrew, 1987; White, 1984; Schein, 1996; Wit and Meyer, 1999)</td>
<td>JISC’s pilot sites’ experience implies there is a need to move to more inclusive, participative culture (JISCs, 1998).</td>
</tr>
<tr>
<td>Resources management</td>
<td>IT and information – different resources (King, 1988); Value chain (Porter, 1990); TSI (Flood and Jackson, 1991b); Resource planning (Johnson and Scholes, 1993); Information systems (Avison and Fitzgerald, 1995); IS functions (Savage and Mingers, 1996); Value from information resource (Ward, et al, 1996); Resource analysis framework (Campbell et al, 1999)</td>
<td>Development and implementation of an information strategy is found to be resource constrained. Some HEIs considered reduction of resources as one of the main reasons for having an information strategy.</td>
</tr>
<tr>
<td>Information needs analysis</td>
<td>‘What can be known’ (Kant, 1787); Three interests (Habermas, 1972); ‘Interpretative’ paradigm (Burrell and Morgan, 1979); SSM (Checkland, 1981); System movement (Checkland, 1983); ‘Is’ and ‘ought’ (Ulrich, 1983); SoSM (Jackson and Keys, 1984); Management strategies for IT (Earl, 1989); TSI (Flood and Jackson, 1991b); Supply and Demand of Information (Smits et. al., 1997)</td>
<td>Information needs paramount (JISC’s Guidelines, 1998); Pilot sites case studies show incorporation of ‘user’ views is weak; Information analysis at Luton reveals a lot of issues.</td>
</tr>
<tr>
<td>Strategic alignment</td>
<td>Align strategies (Earl, 1989); Integrating various strategies (Galliers, 1993); Strategic alignment model (Henderson and Venkatraman, 1993); Linkage between information strategy and business strategy (Smits et al, 1997); information systems strategic management (Clarke, 2001a)</td>
<td>Poor strategic alignment in some pilot sites; Alignment of different strategies in UK HEIs were poor (HEFCE, 1998); Some HEIs use the terms IT, IS and information interchangeably.</td>
</tr>
<tr>
<td>Managing strategic change</td>
<td>Styles and other issues in change management (Johnson and Scholes 1993); Mechanistic approach (Mintzberg and Westley, 1992); Information systems strategic management (Clarke, 2001a)</td>
<td>Overall, management of strategic change is weak, with over-emphasis on operations, lack of long-term vision, and human issues poorly addressed.</td>
</tr>
<tr>
<td>Evaluative structures</td>
<td>Strategic choice (Johnson and Scholes, 1993); information systems strategic management (Clarke, 2001a)</td>
<td>JISC’s Guidelines (1998): Monitoring and review (aspirations)</td>
</tr>
</tbody>
</table>
4.5 Chapter Summary

The proposed initial framework of Figure 4.7 is intended to assist an investigator to evaluate an HEI’s information strategy across a range of issues, in particular to examine not only what has been done, but also what ought to have been done as informed by a critical perspective. As Figure 4.7 and Table 4.6 indicate, an HEI’s information strategy has been broken down into four high-level aspects: control structures, the HEI’s external environment, and its internal environment and CST perspectives. For each of these aspects more specific elements that relate to an information strategy have been identified and within each of these elements CST ideas are explicitly embedded.

This chapter, which lies at the heart of this thesis, discusses how the initial framework has been built and gives detailed information on how each element of the framework should be handled in the practical evaluation of an information strategy. Each of the elements is generally referred back to a well-defined body of knowledge in either the theoretical or empirical literature, or both, in the relevant sections in Chapters 2 and 3, and is generally also covered by more detailed discussion. Each of these elements is also discussed in terms of more practical evaluation tips listed under ‘guidelines for evaluation’. The latter are intended to be suggestions and hints, including those for using critical systems thinking ideas, that are intended to help the evaluator in carrying out a practical strategy evaluation at a UK HEI.
PART III

THE RESEARCH METHODOLOGY AND
THE EMPIRICAL INVESTIGATIONS
CHAPTER 5

DESIGN OF THE RESEARCH METHODOLOGY
CHAPTER 5
DESIGN OF THE RESEARCH METHODOLOGY

5.1 Introduction

In the previous chapters, the aim and objectives for this study were set, with the viewpoint being taken that both the management of information and systems thinking are characterised by diversity and subjectivity. Consequently, this viewpoint informs the choice of research methodology as set out in this chapter.

The chapter starts with a survey of different views on the nature of research – the debates between subjective and objective and between qualitative and quantitative. This leads to the research methodology designed for this study. Specific research methods selected are defined, and Maxwell’s (1996) interactive model of research design is adopted for the research investigations of this study. This is followed by an introduction to the data analysis approach adopted, and the methods used for improving the reliability of the research. The chapter concludes with a summary.

5.2 The Nature of Research

In this section, key issues connected with the general nature of research related to this study are discussed, in particular, subjective research versus objective, and qualitative research versus quantitative.
5.2.1 Subjective versus Objective

A major dichotomy that exists in research lies in choosing between subjective and objective methods. Views of a number of well-known researchers on this topic have been reviewed, and are summarised below.

Burrell and Morgan (1979) see the subjective-objective dimension in terms of four elements - ontology, epistemology, a view of the human nature, and methodology (Figure 5.1). Each of these elements has its set of assumptions. Based on the review of Burrell and Morgan’s work, their views are summarised as follows.

The subjective –objective dimension

<table>
<thead>
<tr>
<th>The subjectivist approach to social science</th>
<th>The objectivist approach to social science</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominalism</td>
<td>Realism</td>
</tr>
<tr>
<td>Anti-positivism</td>
<td>Positivism</td>
</tr>
<tr>
<td>Voluntarism</td>
<td>Determinism</td>
</tr>
<tr>
<td>Ideographic</td>
<td>Nomothetic</td>
</tr>
</tbody>
</table>

Figure 5.1 A Scheme for Analysing Assumptions about the Nature of Social Science (Adapted from Burrell and Morgan, 1979: 3)

As the figure indicates, the first set of assumptions concerns ontology, which concerns the nature of reality, from the viewpoint of what the world is, or contains. The two opposing extremes of thought are nominalism (reality is a product of individual consciousness) and realism (reality is external to the individual). For the realist, the social world exists independently of an individual’s appreciation of it. For the nominalist, the reverse is true. The second set of assumptions concerns epistemology. Epistemology is the branch of philosophy concerned with the theory of knowledge (Flew, 1979), relating to how
the world might be understood. The two opposing extremes are positivism and anti-positivism. While the positivist holds the view that knowledge is hard, real and capable of being transmitted in a tangible form, the anti-positivist has the view that 'knowledge' is of a softer, more subjective, or spiritual kind, based on experience and insight of unique and essentially personal nature.

The third set of assumptions concerns human nature, and the relationship between human beings and their environment. Human nature may be viewed on a scale from determinism to voluntarism. The determinist has the view that human beings and their experiences are considered as products of the environment. In contrast with this, the voluntarist holds the view that human beings have “free will”, and create and control their own environment. The three sets of assumptions discussed above have strong implications of a methodological nature. Each set of assumptions has direct consequences for the way in which one attempts to investigate and obtain knowledge about the social world. Different ontologies, epistemologies and models of human nature are likely to lead social scientists/researchers towards different methodologies. For example, a realist ontology, positivist epistemology and view of human beings as largely deterministic leads to ‘nomothetic’ methodologies aiming to search for universal laws that govern the reality that is being observed, leading to a systematic approach. A nominalist ontology, anti-positivist epistemology, and view of human beings as largely voluntaristic, points to ‘ideographic’ methodologies aiming to understand the way individuals interpret the world, with a questioning of external ‘reality’. This view provides a framework for thinking about the philosophies underlying different research methodologies, and links with the analysis on social theory which was presented in Chapter 2.

Easterby-Smith et al. (1991) support Burrell and Morgan's views, arguing that the ‘objectivist’ position sees the world as external and objective, the observer as independent, and the findings as value-free. In other words, the objectivist asserts that social phenomena and their meanings have an existence that is independent of social factors. Thus, the researcher should focus on facts, look for causality and fundamental laws, reduce phenomena to simplest elements, formulate hypotheses and then test them. This research method includes
‘operationalising’ concepts, so that they can be measured, and taking large samples where appropriate. This approach has the advantage of applicability to a wide range of research situations, and can be fast and economical in generating results. But it has a number of disadvantages. These include being not very effective in understanding ‘process’, and undervaluing the significance that people attach to actions. By contrast, ‘subjectivists’ believe that the world is socially constructed and subjective, the observer is part of what is observed, and research findings are driven by human interests. In this approach, the researcher should focus on meanings, try to understand what is happening, look at the totality of each situation, and develop ideas through induction from data. This position prefers using multiple methods to establish different views of phenomena, and small samples investigated in depth or over time. While this approach has the weaknesses of time-consuming data collection, difficulties in analysing and interpreting data, and in controlling the pace, progress and endpoints of the research, it has strengths over the objectivist position. By using subjective methods, the researcher is able to look at the change in processes over time, to understand people’s real meanings, to adjust to new issues and ideas as they emerge, and to contribute to the evolution of new theories.

In line with the overall focus of this research, the decision was taken that the investigation would be mainly subjective in approach. While many objective facts emerged within the research, subjective methods were used to determine the underlying human perceptions and motivations that led to the actions that were taken.

5.2.2 Qualitative versus Quantitative

Another common distinctions a researcher needs to make is between qualitative and quantitative research methods. Quantitative research methods were originally developed in the natural sciences to study natural phenomena. Examples of quantitative methods include laboratory experiments, survey methods and numerical methods (e.g. mathematical modelling). Qualitative research methods were developed in the social sciences to enable researchers to
study social and cultural phenomena. Examples of qualitative methods are action research, participant observation, case study research and ethnography. Qualitative data sources can include questionnaires, interviews, discussions, observations, documents, meeting minutes and the researcher’s research notes (e.g. impressions and reactions).

In Ragin’s (1994) view, *qualitative research* is a basic strategy of social research that usually involves *in-depth* examination of a relatively small number of cases, and in which cases are examined intensively with techniques designed to facilitate the clarification of theoretical concepts and empirical categories. By contrast, *quantitative research* largely concentrates on issues that can be measured accurately, and where an analysis of such measurements leads to conclusions based on *reliable* variables. In general, qualitative approaches are associated with subjective research, and quantitative with objective.

Brewer and Hunter (1989) define qualitative research as *multi-method* in focus, involving an *interpretive, naturalistic* approach to its subject matter. Denzin and Lincoln (1994) state that qualitative research may involve the studied use and collection of a *variety of empirical materials* that describe routine and problematic moments and meanings in individuals’ lives which may include case study, personal experience, introspective, life story, interview, and observational, historical, interactional and visual texts.

The key features of qualitative and quantitative research methods are summarised by Clarke and Lehaney (2000: 545) in Figure 5.2. In the view of the above authors, quantitative or *functionalist* research methods see an objective reality to be investigated. This realist ontology leads to *positivist* epistemologies, which take a *deterministic* or mechanistic view of the system of concern, and the human participants who are part of it. Scientific method is preferred with techniques such as *reductionism* and *experimentation* coming to the fore. Validity is sought through processes of *repeatability* or *refutation*. Where *empiricism* is used, it is predominantly through *inductive* method, searching for the solution or some form of *objective truth*.

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Qualitative or interpretivistic research assumes, by contrast, a nominalist ontology. Its epistemological position is anti-positivistic, in which human participants are viewed as voluntaristic. The primary approaches to research are therefore systemic rather than reductionist, focusing on participative methods such as action research. Validity depends not on repeatability or refutation, but on the perceived acceptability of conclusions on the part of participants: the approach is much more challenging and a normative position acceptable. An empiricist approach is also acceptable here, but again pursues normative validity through dialectics, rather than holding any sort of view of objective truth.

Two main features of qualitative research can be summarised as: (a) it focuses on naturally occurring, ordinary events in natural settings, so it gives a strong handle on what real life is like; (b) it shows its richness and holism with a
strong potential for revealing *complexity*. The data collected using qualitative research methods thus provide thick and vivid descriptions that are nested in a real context (Miles, 1994).

Based on the accounts on quantitative and qualitative methodology from the afore-mentioned authors and other researchers, the main characteristics of these methodologies are summarised in Table 5.1.

*Table 5.1 Summary of the Main Characteristics of Quantitative and Qualitative Research Methodology*

<table>
<thead>
<tr>
<th>Concern</th>
<th>Quantitative</th>
<th>Qualitative</th>
</tr>
</thead>
<tbody>
<tr>
<td>The nature of reality</td>
<td>Objective and singular; apart from the researcher.</td>
<td>Subjective and multiple as seen by participants in a study.</td>
</tr>
<tr>
<td>Relationship</td>
<td>Researcher is independent from that being researched.</td>
<td>Researcher interacts with that being researched.</td>
</tr>
<tr>
<td>Role of values</td>
<td>Science is value-free and unbiased</td>
<td>Science is value-laden and biased (driven by human interests)</td>
</tr>
<tr>
<td>Language of research</td>
<td>Formal and based on set definitions; impersonal voice; use of accepted quantitative words.</td>
<td>Informal and based on evolving decisions; personal voice; use of accepted qualitative words.</td>
</tr>
<tr>
<td>Focus</td>
<td>Focus on facts; look for causality and fundamental laws; reduce phenomena to simplest elements; formulate hypotheses and then test them.</td>
<td>Focus on meanings; try to understand what is happening; look at the totality of each situation, develop ideas through induction from data.</td>
</tr>
<tr>
<td>Favoured methods</td>
<td>Operationise concepts so that they can be measured; take large samples.</td>
<td>Uses multiple methods to establish different views of phenomena; take small samples, but study them in depth or over time.</td>
</tr>
<tr>
<td>Process of research</td>
<td>Deductive, cause and effect; static design – categories isolated before study; context-free; generalisations leading to prediction, explanation, and understanding; accurate and reliable through validity and reliability.</td>
<td>Inductive, mutual simultaneous shaping of factors; emerging design – categories identified during research process; context-bound; patterns, theories developed for understanding; accurate and reliable through verification.</td>
</tr>
<tr>
<td>Advantages</td>
<td>Wide coverage of the range of the situations, fast and economical.</td>
<td>Able to look at change processes, understand people’s meanings, accept new issues as they emerge, and contribute to the evolution of new theories.</td>
</tr>
<tr>
<td>Disadvantages</td>
<td>Inflexible and artificial; not very effective in understanding processes or the significance that people attach to actions; not very helpful in generating theories.</td>
<td>Takes time and resources for data collection; difficult to analyse and interpret large volume of textual data; difficult to control the pace, progress and end-points.</td>
</tr>
</tbody>
</table>
5.2.3 The Nature of This Research

The motivation for doing qualitative research, as opposed to quantitative research, comes from the observation that, if there is one thing which distinguishes humans from the natural world, it is our ability to talk (Mayers, 1997). As implied above, qualitative research methods are designed to help researchers understand people and the social and cultural contexts within which they live. Since the management of information is seen as a social phenomenon (see Section 2.2), quantitative research methods would represent an impoverished view. Qualitative methods can be employed to reach the goal of understanding such phenomenon and to provide a richer picture of the research situations from the point of view of the participants and particular social contexts.

A review of the available qualitative methods in the research domain showed that suitable methods for this study are action research, ethnography and case study. These methods are defined and described in the following section to provide a general view, with details of the actual applications of each method being found in Chapters 6 to 9.

5.3 Definitions and Discussion of the Selected Research Methods

5.3.1 Action Research

Researchers have given many similar definitions to the term action research (AR). For example, Rapoport (1970: 499) views AR as contributing “both to the practical concerns of people in an immediate problematic situation and to the goals of social science by joint collaboration within a mutually agreed ethical framework”. Ragsdell (1998: 505-506) agrees to this, defining AR as a “research strategy” that “attempts to link theory and practice” and “aims to combine the practical concerns of people in the problem situation with the goals of social science”. Ein-Dor and Segev (1981) hold a similar view, considering AR as applied research where there is an attempt to obtain practical results of value to
groups with whom the researcher has allied himself/herself while at the same time adding to the body of theoretical knowledge.

The definitions above draw attention to the collaborative aspect of AR, and to possible ethical dilemmas which arise from its use. It also makes clear that AR is concerned to enlarge the stock of knowledge of the social science community. In Argyris' (1985) view, becoming an action researcher involves learning to reflect on reflection-in-action, making explicit the theories-in-use that inform it, and learning to design and produce new theories-in-use for reflection and action. Easterby-Smith, et al. (1991) consider two beliefs as being part of AR projects: the belief that learning about an organisation will be achieved best in attempting to change it; and the belief that those involved in implementing changes, and those affected by changes, should become involved in the research process.

Action research refers to a class of research approaches rather than a single research method (Baskerville, 1999). As a class, the various forms of AR share some agreed characteristics. Literature shows that AR is commonly regarded as having the characteristics of:

- An action and change orientation;
- A focus on a problem;
- Genuine participation with the people involved in the research process;
- Collaboration among participants;
- A process seen as educative and empowering; and involving (sometimes iterative stages of) problem identification, planning, action and evaluation.

These characteristics distinguish AR from other approaches to social enquiry. Based on literature (e.g. Gummesson, 1991; Checkland and Holwell, 1998; Baskerville, 1999), other distinctive characteristics that differentiate AR from other research can be summarised as follows:

- There must be both a contribution to research and a 'client'-centred problem-solving aspect.
- The researcher and the 'client' should develop competence by learning from each other.
- The action researcher should take a holistic (systemic) approach.
- There should be a dynamic of adjustments to new information and events, which is fostered by feedback and co-operation between the 'client' and the researcher.
- The prime role of AR is in investigating and planning change in social systems.

There are a variety of different research forms within this class of AR approaches. These forms were "inventoried and analysed from different perspectives" within the information systems (IS) research (Baskerville, 1999: 9). One perspective recognised ten distinct forms of AR in IS, along with four distinguished characteristics (Baskerville and Wood-Harper, 1998). These forms and characteristics are summarised in Table 5.2.

### Table 5.2 IS Action Research Forms and Characteristics

<table>
<thead>
<tr>
<th>Forms of IS Action Research</th>
<th>Characteristics of IS Action Research</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Canonical</td>
<td>(1) Process model</td>
</tr>
<tr>
<td>(2) IS prototyping</td>
<td>- Iterative</td>
</tr>
<tr>
<td>(3) Soft systems methodology</td>
<td>- Reflective</td>
</tr>
<tr>
<td>(4) ETHICS</td>
<td>- Linear</td>
</tr>
<tr>
<td>(5) Multiview</td>
<td>(2) Structure</td>
</tr>
<tr>
<td>(6) Action science</td>
<td>- Rigorous</td>
</tr>
<tr>
<td>(7) Participant observation</td>
<td>- Fluid</td>
</tr>
<tr>
<td>(8) Action learning</td>
<td>(3) Typical involvement</td>
</tr>
<tr>
<td>(9) Clinical field work</td>
<td>- Collaborative</td>
</tr>
<tr>
<td>(10) Process consultation</td>
<td>- Facilitative</td>
</tr>
<tr>
<td></td>
<td>- Expert</td>
</tr>
<tr>
<td></td>
<td>(4) Primary goals</td>
</tr>
<tr>
<td></td>
<td>- Organisational development</td>
</tr>
<tr>
<td></td>
<td>- System design</td>
</tr>
<tr>
<td></td>
<td>- Scientific knowledge</td>
</tr>
<tr>
<td></td>
<td>- Training</td>
</tr>
</tbody>
</table>

Action researchers recognise that "human activities are systematic, and that they are "intervening in social systems" (Baskerville, 1999: 8). AR has been an established research method in applied fields such as organization development and education (e.g. see Kemmis and McTaggart, 1988; Myers, 1997). However,
AR was for a long time largely ignored in IS, but more recently, there seems to be increasing interest in AR. Early work by Mumford (Mumford and Weir, 1979) brought her AR experience into the IS field as a systems development technique called ETHICS. Wood-Harper (Wood-Harper et al., 1985) incorporated AR concepts into an action-based systems development methodology called Multiview. Checkland's use of AR in systems analysis is another landmark for the method used in the IS field (Checkland, 1981a, 1988; Checkland and Scholes, 1990; Checkland and Holwell, 1998). Checkland used AR to develop his soft systems methodology, and as a result, AR concepts for gaining professional knowledge permeate the soft systems approach itself.

5.3.2 Ethnography

Ethnographic research, according to Myers (1997: 276), "comes from the discipline of social and cultural anthropology where an ethnographer is required to spend a significant amount of time in the field". Bryman (2004) agrees to this, saying that ethnography is a research method in which "the researcher immerses himself or herself in a social setting for an extended period of time, observing behaviour, listening to what is said in conversations both between others and with the fieldworker, and asking questions" (Bryman, 2004: 539). Thus the goal of ethnographic research is to improve our understanding of human thought and action through interpretation of human actions in context.

As implied above, one of its defining features of ethnography is participant observation. The ethnographer "immerses himself in the life of people he studies and seeks to place the phenomena studied in their social and cultural context" (Lewis, 1985, 380). However, ethnography is often used where the focus of the study is "the culture of the group in which the ethnographer is immersed" (Bryman, 2004: 293). This source of data for ethnography may be supplemented by interviews and documentary evidence such as reports, minutes of meetings and so forth.

Ethnography, as a research method, is well suited to providing information systems researchers with rich insights into the human, social and organizational
aspects of information systems development and application (Harvey and Myers, 1995). Myers (1999) points out that ethnography has been discussed as a method whereby multiple perspectives can be incorporated in systems design (Holzblatt and Beyer, 1993) and as a general approach to the wide range of possible studies relating to the investigation of information systems (Pettigrew, 1985). He goes on to say that in recent years a growing number of information systems researchers have recognised the value of ethnography for information systems research (Wynn 1991). Orlikowski and Baroudi (1991) used ethnography to study a large multinational software consulting firm over eight months collecting data via participant observation, interviews, documents and informal discussions with the participants. The profound strength of ethnography is that “it is the most ‘in-depth’ or ‘intensive’ research method possible”, but the main disadvantage is that “it takes a lot longer than most other kinds of research” (Myers 1999: 5-6).

5.3.3 Case Study

The term ‘case study’ has multiple meanings. It can be used to describe a specific investigation (e.g. a case study of a particular organisation) or to describe a research method. The discussion here concerns the use of the case study as a research method.

Case study research is one of the most common research methods used in information systems. Yin (1993) defines a case study as an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident.

Case studies can be qualitative or quantitative, or a combination of the two. In the fundamental pursuits common to both qualitative and quantitative research, Yin (1992) finds the four common commitments of case studies to be: to bring expert knowledge to bear upon the phenomena studied; to round up all the relevant data; to examine rival interpretations; and to ponder and probe the degree to which the findings have implication elsewhere.

The main features of case study are summarized by Stake (1994):
(a) As a form of research, case study is defined by interest in individual cases, not by the methods of inquiry used.

(b) Each study is a concentrated inquiry into a single case. It emphasizes the question of 'what can be learned from this single case'.

(c) A case study is both the process of learning about the case and the product of our learning.

(d) Case studies are often descriptive, and exploratory, and are concluded with implications for further study.

Having defined the research methods chosen for this study, the next section looks at the research design components for each of the research investigations.

5.4 Designing Research Components

5.4.1 Maxwell’s Interactive Model

“A ‘well-designed’ object is an object whose component parts have been designed to be able to work together and in sequence such that the functions, or purposes, for which the object was designed are most likely to be served.” (Wengraf, 2001: 56). For this study, Maxwell’s interactive model of research design (Maxwell, 1996: 4-5) was found a good match (see figure 5.3).

![Maxwell's Interactive Model of Research Design (Maxwell, 1996: 4-5)](image-url)
As illustrated in the figure, the model has five basic design components – purposes, conceptual context, research questions, methods, and validity, which are characterised by the issues that each is intended to address. Based on Maxwell (1996), the main issues that each of these components can address are summarised in question form as below:

**Purposes:** What are the ultimate goals of this study? What issues is it intended to illuminate, and what practices will it influence? Why do you want to conduct it, and why should we care about the results? Why is the study worth doing?

**Conceptual Context:** What do you think is going on with the phenomena you plan to study? What theories, findings and conceptual frameworks relating to these phenomena will guide or inform your study, and what literature, preliminary research and personal experience will you draw on?

**Research Questions:** What do you want to understand by doing this study? What do you not know about the phenomena you are studying that you want to learn? What questions will your research attempt to answer, and how are these questions related to each other?

**Methods:** What will you do in conducting this study? What approaches and techniques will you use to collect and analyse your data, and how do these constitute an integrated strategy?

**Validity:** How might you be wrong? What are the alternative explanations and validity threats to the potential conclusions of your study, and how will you deal with these? How do the data that you have, or that you could collect, support or challenge your ideas about what’s going on? Why should I believe your results?

### 5.4.2 Research Components Design for the Selected Investigations

Having introduced Maxwell’s interactive model (Maxwell, 1996), Table 5.3 uses the model to present in summary form the research components designed for each of the four empirical research investigations designed for this study.


<table>
<thead>
<tr>
<th>Research Theme</th>
<th>Purposes*</th>
<th>Conceptual Context</th>
<th>Research Question</th>
<th>Methods</th>
<th>Validity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Investigating the problems of a students records systems at a UK HEI</td>
<td>Provide a background knowledge on the development of an evaluative framework</td>
<td>Serious problem confronted by system users which resulted in low quality information provision</td>
<td>Identify problems, analyse causes and suggest solutions for improvement</td>
<td>Action Research: Review documents; act as system user; interview system users; report findings</td>
<td>Consult experts, check results with respondents, confirm findings with daily users of the system</td>
</tr>
<tr>
<td>2. Participating in the process of an information strategy development at the HEI</td>
<td>Observe how a typical HEI develops its information strategy; consider paths to such strategy implementation</td>
<td>JISC was working on information strategy development; the research institution had just started such a development.</td>
<td>Identify key issues/problems in such strategy development, how decisions are reached.</td>
<td>Ethnography: Read documents, observe decision-making process at meetings, conduct in-depth interviews, write reports</td>
<td>Compare data with other investigators/researchers, check results with people involved.</td>
</tr>
<tr>
<td>3. Investigating experts' views at JISC workshops and conferences on information strategy</td>
<td>Confirm issues already identified in this research, and gain wider views and insights on the study</td>
<td>JISC offered workshops &amp; conferences on information strategy development</td>
<td>Explore experts' ideas on information strategy development from other HEIs; identify what other HEIs had done.</td>
<td>Ethnography: Read documents Making observation at workshops and conferences, interview experts, have discussions</td>
<td>Compare findings with those from the cases 1 &amp; 2</td>
</tr>
<tr>
<td>4. Investigating the implementation of an information strategy at another HEI</td>
<td>To confirm and validate the framework</td>
<td>Well-developed information strategy; Cases available from other JISC pilot sites</td>
<td>Identify success factors for information strategy implementation</td>
<td>Case Study: Access documents, interview people involved &amp; affected</td>
<td>Compare views of people within the CS institutions with those of outsiders</td>
</tr>
</tbody>
</table>

*The main purpose of all the cases chosen is to support the development of a framework for assisting information strategies in HEIs.*
To expand Table 5.3, the four empirical investigations designed for the primary data collection of this research are as follows:

A. Action Research: Investigating a Student Records System

The action research was to investigate a student records system (SRS) at a UK HEI, aiming to provide a realistic ‘operational’ background to this study. The SRS had played a very important role in the management of information in this university and indeed in all HEIs. However, the system at this university had shown a variety of problems and become a focus of strategic management attention as a result. So this investigation was intended to understand the main issues involved in the management of the SRS, to identify problems with the SRS, to identify the proximate and deeper causes for these problems, and to suggest solutions for improving the system.

Within this action research, the main methods used included: document review; acting as a system user, conducting conversations, discussions and semi-structured interviews with other users of the SRS, interventions with problems and concerns of co-workers, and feedback and liaison with the more senior management staff. To improve the research validity, the researcher checked results with the respondents, confirmed findings with daily users of the SRS, compared the data with another investigator of the system. The findings from the action research were fed into the university’s information strategy development process, which is the second investigation of this research.

B. Ethnography I: Investigating the Development Process of an Information Strategy

The ethnographic research was to investigate the process of an information strategy development. The main purpose was to find out how an information strategy at a typical HEI was formulated. When this research started, JISC was encouraging HEIs to develop their information strategies, and the university selected for this research had just decided to develop an information strategy. It
had formed an Information Strategies Steering Group to oversee the development of such a strategy.

The main objectives of this ethnography were to identify key issues in the process of information strategy development; to gain a broader view of general information management at this university; to understand the decision-making process of the university; to uncover deeper views of the university's senior people on issues associated with information strategy, and to consider paths to implementing such a strategy. Within this ethnographic research, the main activities included:

- Attending and observing all the meetings of the University's Information Strategies Steering Group (ISSG), and participating in decision-making process for the information strategy development;
- Interviewing all the group members (at least once). Most of them were the university's key decision-makers.
- Conducting formal and informal interviews and ad hoc discussions with over forty other staff and student representatives from across the university;

By participating in the ISSG meetings over an extended period to examine development process of the information strategy, the researcher also attempted to examine the 'culture' of the members of the ISSG, to determine, for example, how the social aspects of the group affected the decisions that were arrived at.

As both the action research and the ethnography were conducted within the same university, and both were about the management of information, the coverage of this investigation was found to overlap the previous one. Therefore, many of the findings from the action research were used to confirm the findings of this research, and thus helped improve the research validity.
C. Ethnography II: Obtaining Experts’ Views on Information Strategy

The participant observation involved the researcher’s attendance at a series of five one-day workshops spread over one academic year and three conferences designed by JISC on development of information strategies of HEIs. The purpose of the participant observation was to gain wider views and insights on information strategy development at other HEIs, and to confirm findings from the previous two investigations.

The main activities at these meetings included: accessing empirical documents of other HEIs on information strategy; participating in the discussions on information strategy; reporting on the progress of the information strategy development at the university investigated for this study; gaining information on what other HEIs were doing for developing such strategies; interviewing other representatives to elicit their views on related issues at their institutions. This participant observation helped confirm some of the findings from the ethnographic research, and the findings from this and the action research also contributed to a better understanding of the social issues revealed at these meetings.

D. Case Study: Investigating the Implementation of an Information Strategy

The case study, the final piece of empirical research, investigated the process and methods involved in the implementation of an information strategy at a different UK university, one of JISC’s pilot sites for information strategy development. The purpose of the case study was, through the investigation of the implementation process of the information strategy, to carry out critical analysis of the key factors which account for the success and/or failure of the different elements of an information strategy and to add further insights to the evaluation framework.

The main research activities for this case study included: accessing relevant documents available from both inside the university and from other outside sources; contacting key people from the case study university for
interviews (including key members of its information management group, the information strategy drafter, people with roles and responsibilities for the implementation of the strategy, and other staff and student representatives); conducting in-depth interviews; visiting the university's library for supportive evidence of good information management. To improve the validity of the research experts from outside the university, such as JISC's information strategy co-ordinator and managers who were looking after the information strategy development in other HEIs, were also asked for insights.

The findings from the first three empirical research investigation described above allowed aspects of the evaluative framework developed in Chapter 4 to be re-examined through an iteration of critique and modification as set out in Chapters 6 to 8, and the findings from this case study led to the final revised version of the framework given in Chapter 9 of this thesis.

5.5 Approach for Data Analysis

Once the data collection was completed after each piece of the empirical research (namely, action research, ethnography and case study), the approach for data analysis adopted was the 'model for qualitative data analysis' (Figure 5.4) developed by Huberman and Mathew (1994: 429). As indicated in the figure, there are three linked sub-processes in the model – data reduction, data display and conclusion drawing/verifying.

According to the Huberman and Mathew (1994: 430), in the stage of data reduction, 'the potential universe of data is reduced in an anticipatory way' as the researcher chooses a conceptual framework, research questions, cases, and instruments. Data reduction, according to Miles and Huberman (1994: 10) refers to "the process of selecting, focusing, simplifying, abstracting, and transforming the data that appears in written-up field notes or transcriptions". In the case of this research, once the actual documents, observation notes, meeting minutes, interview transcripts and tapes were available, data reduction was achieved by further data selection and condensation, for example, finding themes, and writing summaries of interview transcripts.
The second stage of data analysis is data display. This is “an organised, compressed assembly of information that permits conclusions drawing and action” (Miles and Huberman, 1994: 11). For this research, displays were in various forms to facilitate further data analysis, for example, observation notes (both hand-written and type-written), meeting minutes, summary of published documents, notes for literature review, interview transcripts, types recordings, e-mails, and so on. Samples of the reduced set of data were collected and stored in hard and/or e-copies as a basis for thinking about the meanings.

The final stage of the data analysis is conclusion drawing and verification. This involves the researcher in interpretation (drawing meaning from displayed data), tactics (use of triangulation, checking results with respondents), and clustering (use of comparison/contrast, noting of patterns and themes). From a very early stage of data collection for this study, the researcher began to think about what things meant, and noted patterns, explanations and propositions. However, the ‘final’ conclusion did not appear until data collection was over, as the data process was a long one and the size of the data collected was huge. Even though the data reduction process was always going on, it took quite some effort to arrive the point of drawing the final conclusions. In the view of Miles and Huberman. (1994), conclusions are also verified as the analyst proceeds. The authors continued that “verification may be as brief as a fleeting second thought.
crossing the analyst's mind during writing, with a short excursion back to the field notes, or it may be thorough and elaborate, with lengthy argumentation and review among colleagues to develop 'intersubjective consensus', or with extensive efforts to replicate a finding in another data set" (Miles and Huberman, 1994: 11).

This model for data analysis allows a large corpus of unstructured textual material to be processed so as to be easier to manage and comprehend. As can be seen in the later chapters, this model was adopted in analysing data collected from all research investigations conducted for this research.

5.6 Methods to Improve the Reliability of the Research

In qualitative research, triangulation is seen as one of the key methods to help minimise misconceptions and increase the validity of conclusions (Yin, 1994; Gummesson, 1991; Easterby-Smith et al. 1991). Triangulation entails using more than one method or source of data in the study of social phenomena. The term has been employed more broadly by Denzin (1970:310) to refer to an approach that uses 'multiple observers, theoretical perspectives, sources of data, and methodologies', but the emphasis has tended to be on methods of investigation and source of data. In order to improve the quality of the research results, the four basic types of triangulation (data, investigator, theory, and methodological) as proposed by Denzin (1978) were used.

A. Data Triangulation

For data triangulation, a variety of data sources were collected and used for analysis in this study. These included both primary data and secondary data. The primary data of this research included the researcher's participant observation notes taken at the Information Strategy Steering Meetings (Ethnography I) , and at JISC workshops and conferences (Ethnography II), transcripts of interviews, notes taken at the meetings and workshops. The secondary data included data from the literature review, from the empirical reports on the development and implementation of the information strategies at HEIs by JISC and by other
institutions. Information was also drawn from different library facilities including the University of Luton, the University of Hull and the British Library. Internet resources have also been used extensively. The latter, in particular, provided substantial information on current practice of information strategy initiatives in HE, including the strategic planning model for information strategy development from JISC, and the documents of information strategies of various UK HEIs. Data from these different sources were analysed and compared before conclusions were drawn.

**B. Investigator Triangulation**

In terms of *investigator* triangulation, it was not an easy task to complete. It was unlikely to find someone who would like to conduct the same piece of research using exactly the same methods, though in the case of this research, a number of different researchers and 'experts' were consulted on issues associated with the research topic. These included JISC Information Strategy co-ordinators, representatives from more than 20 HEIs at the JISC workshops and the main authors of documents on information strategies at various UK universities. For example, regarding the investigation of the student records system (SRS) in the Action Research (see Chapter 6), the views of the Information Strategy Coordinator at the same university, who also looked at the system, were taken into account to help add reliability to the research outcome. In terms of the case study (see Chapter 9) which investigated the information strategy implementation of another university, opinions from different 'experts' were collected and assessed. All this has helped contribute to the validity of the research findings and conclusions.

**C. Theory Triangulation**

For *theory* triangulation, multiple perspectives were sought and used to interpret the data. This was achieved by comparing and contrasting different theoretical perspectives which formed a part of the critique of the study. Details of
the various theoretical and philosophical perspectives related to this study are given in Chapter 2.

**D. Methodological Triangulation**

For methodological triangulation, multiple research methods have been adopted for different research investigations including action research, ethnographic research, and case study. Within these a range of associated research techniques was used covering structured and unstructured interviews, *ad hoc* conversations, participative and opportunistic observations, and direct involvement in the research situations including committee and workshop discussions. Details of these are given in Chapters 6 to 9.

In addition, in the process of this research, the researcher has attended a variety of associated conferences, meetings, workshops and seminars both for conducting the research itself and for presenting papers based on this research. These research activities have broadened the researcher's view in various aspects of the research undertaken and added extra insights into this research project. Therefore they helped to certain extent improve the validity of this research. Key associated research activities within this project are as listed in Table 5.4.

As Flick (1999) points out, employing the various types of triangulation, the combination of multiple methods, empirical materials, perspectives and observers in a single study adds rigor, breadth, and depth to an investigation, and the outcome becomes more valid and reliable.
<table>
<thead>
<tr>
<th>Date</th>
<th>Type of Activity</th>
<th>Organiser/Location</th>
<th>Theme</th>
<th>Purpose (To...)</th>
</tr>
</thead>
<tbody>
<tr>
<td>21/01/99</td>
<td>System Demonstration</td>
<td>University of Luton</td>
<td>Demonstration of the HEMIS System</td>
<td>Obtain background understanding of the system (Contribute to the Action Research of this study)</td>
</tr>
<tr>
<td>01/02/99</td>
<td>Research Meeting</td>
<td>Director of the research project/Lincoln</td>
<td>Discussion about research objectives &amp; methodologies</td>
<td>Obtain views of the External Supervisor</td>
</tr>
<tr>
<td>22/02/99</td>
<td>System Demonstration</td>
<td>University of Luton</td>
<td>Demonstration of Students Records Systems</td>
<td>Understand how the system works (Part of Action Research of this study)</td>
</tr>
<tr>
<td>22/3/99</td>
<td>JISC Workshop</td>
<td>JISC/London</td>
<td>Prioritising Information Needs</td>
<td>Obtain expert view (Part of Ethnography II of this study)</td>
</tr>
<tr>
<td>03-04/99</td>
<td>Research Seminars</td>
<td>University of Luton</td>
<td>University Research Methods Programmes</td>
<td>Learn about research methods</td>
</tr>
<tr>
<td>05/05/99</td>
<td>Research Seminar</td>
<td>LASEORS/London</td>
<td>Information Systems Development</td>
<td>Learn from senior researcher in the area</td>
</tr>
<tr>
<td>20/05/99</td>
<td>JISC Conference</td>
<td>JISC/Nottingham</td>
<td>4th Information Strategy Conference</td>
<td>Learn from other organisations about information strategy</td>
</tr>
<tr>
<td>26/05/99</td>
<td>Research Seminar</td>
<td>University of Loughborough</td>
<td>Information Systems Research</td>
<td>Learn more about the research area</td>
</tr>
<tr>
<td>10/06/99</td>
<td>Research Seminar</td>
<td>LASEORS/London</td>
<td>Information Systems Methodologies</td>
<td>Improve the use of research methodologies</td>
</tr>
<tr>
<td>28/06/99</td>
<td>JISC Workshop</td>
<td>JISC/London</td>
<td>Drafting the information strategy framework document</td>
<td>Understand JISC’s approach to information strategy development (Part of Ethnography II of this study)</td>
</tr>
<tr>
<td>5-9/07/99</td>
<td>UKSS Conference</td>
<td>UKSS/Lincoln</td>
<td>Synergy Matters: Working with Systems in the 21st Century</td>
<td>Broden research views and get to know researchers in the research domain</td>
</tr>
<tr>
<td>13-16/09/99</td>
<td>OR Conference</td>
<td>OR Society/Edinburgh</td>
<td>Annual Conference: OR 41</td>
<td>Make research presentation</td>
</tr>
<tr>
<td>27/09/99– 08/10/99</td>
<td>Working as a user of the Student Records System</td>
<td>University of Luton</td>
<td>Investigating the Student Records System</td>
<td>Carry out the main activities – acting as a system user and conducting interviews for the Action Research of the study</td>
</tr>
<tr>
<td>13-16/09/00</td>
<td>OR Conference</td>
<td>OR Society/Swansea</td>
<td>Annual Conference: OR 42</td>
<td>Make research presentation</td>
</tr>
<tr>
<td>10/02/00</td>
<td>JISC Conference</td>
<td>JISC/British Library/London</td>
<td>5th Information Strategy Conference - Focus on Access and Security</td>
<td>Add extra insights to the research</td>
</tr>
<tr>
<td>19/06/00</td>
<td>Research Seminar</td>
<td>University of Hull</td>
<td>Critical Systems Thinking Research Day</td>
<td>Understand various CST approaches</td>
</tr>
<tr>
<td>07/12/00</td>
<td>JISC Conference</td>
<td>JISC/London</td>
<td>6th Information Strategy Conference - Focus on Funding</td>
<td>Add extra insights to the research</td>
</tr>
</tbody>
</table>
Table 5.4 Associated Research Activities within this Research (Continued)

<table>
<thead>
<tr>
<th>Date</th>
<th>Type of Activity</th>
<th>Organiser/Location</th>
<th>Theme</th>
<th>Purpose (To...)</th>
</tr>
</thead>
<tbody>
<tr>
<td>13/10/99</td>
<td>JISC's 1st Workshop</td>
<td>JISC/Birkbeck College, University of London</td>
<td>Getting Started</td>
<td>Conduct the main activity – participant observation, for Ethnography II of the study. Understand the practice of information strategy development at various UK higher education institutions and obtain experts’ views on the topic.</td>
</tr>
<tr>
<td>24/11/99</td>
<td>JISC's 2nd Workshop</td>
<td>University of London (a series of workshops on developing an information strategy)</td>
<td>Information Needs</td>
<td></td>
</tr>
<tr>
<td>16/02/00</td>
<td>JISC's 3rd Workshop</td>
<td></td>
<td>Planning the Implementation</td>
<td></td>
</tr>
<tr>
<td>15/03/00</td>
<td>JISC's 4th Workshop</td>
<td></td>
<td>Roles and Responsibilities and Drafting the Information Strategy Framework Document Monitoring and Review</td>
<td></td>
</tr>
<tr>
<td>10/05/00</td>
<td>JISC's 5th Workshop</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>07/01/99 -</td>
<td>Attending Information Strategy Steering Group Meetings</td>
<td>University of Luton (Note: 17 such meetings were held during a period of 18 months)</td>
<td>Developing an information strategy N. B. These are the meetings held by University's Information Strategy Steering Group for the development of the university's Information Strategy.</td>
<td>Conduct the main activity – participant observation, for Ethnography I of the study. Understand the key factors that influence the process of decision-making and the results of decisions made.</td>
</tr>
<tr>
<td>24/25/04/01</td>
<td>Case study Investigation</td>
<td>The researcher/University of Hull</td>
<td>Investigating the Information Strategy Implementation at the University of Hull</td>
<td>Carry out the key activity – in-depth interviews for the Case study of the research.</td>
</tr>
<tr>
<td>8-10/07/02</td>
<td>UKSS Conference</td>
<td>UKSS/University of York</td>
<td>Systems Theory: Practice in the Knowledge Age</td>
<td>Present a paper based on this research</td>
</tr>
<tr>
<td>23/10/02</td>
<td>Research Seminar</td>
<td>OR/University of Coventry</td>
<td>Best Practice: Timely Information and Quality Service</td>
<td>Add extra insights to the research</td>
</tr>
<tr>
<td>21/11/02</td>
<td>Research Seminar</td>
<td>UKAIS Cambridge University</td>
<td>Systems Thinking and Information Systems Development</td>
<td>Add extra insights to the research</td>
</tr>
<tr>
<td>27/11/02</td>
<td>Debate</td>
<td>University of Luton</td>
<td>Information Systems Strategy</td>
<td>Broaden views on the topic relevant to the Action Research and Ethnography conducted at this university</td>
</tr>
<tr>
<td>23/12/02</td>
<td>Discussion Forum</td>
<td>University of Luton</td>
<td>Draft document - Information Systems Strategy</td>
<td>Add extra insights to the research</td>
</tr>
<tr>
<td>05/02/03</td>
<td>JISC Conference</td>
<td>JISC/Birmingham Jury Inn</td>
<td>Virtual Learning Environment</td>
<td>Add extra insights to the research</td>
</tr>
<tr>
<td>22/09/03</td>
<td>UKAIS' Workshop</td>
<td>UKAIS/University of Portsmouth</td>
<td>E-Learning</td>
<td>Add extra insights to the research</td>
</tr>
<tr>
<td>29-30/04/04</td>
<td>ECRM Conference</td>
<td>University of Reading</td>
<td>European Conference on Research Methods in Business and Management</td>
<td>Present a paper based on this research</td>
</tr>
<tr>
<td>05-07/05/04</td>
<td>UKAIS Conference</td>
<td>UKAIS/Glasgow</td>
<td>UK Academy of Information Systems Conference</td>
<td>Present a paper based on this research</td>
</tr>
<tr>
<td>25-27/07/04</td>
<td>EMCIS Conference</td>
<td>Brunel University /Tunis</td>
<td>European &amp; Mediterranean Conference on Information Systems</td>
<td>Present a paper based on this research</td>
</tr>
</tbody>
</table>
5.7 Chapter Summary

This chapter has presented the research methodology designed for this study. The research was determined to be predominantly qualitative, in line with the context of the study. It consisted of employing human-centred methods in developing and revising a framework for supporting the evaluation of information strategies at HEIs through four pieces of research investigations – a piece of action research, two pieces of Ethnography and a case study. These research methods are defined and commented on. For each of these research investigations, Maxwell's (1996) interactive model of qualitative research design is used. This model has five basic design components – purposes, conceptual context, research question, methods, and validity. All these components are embedded in each of the research methods selected for this study as is summarised in Table 5.3.

For data analysis, the Interactive Model (Figure 5.4) proposed by Huberman and Mathew (1994) was used, composing three interlinked subprocesses – data reduction, data display and conclusion drawing/verifying. To improve the reliability and validity of the research results, the four basic types of triangulation defined by Denzin (1978) were adopted - data, investigator, theory, and methodological triangulations.

Figure 5.5 outlines the overall research methodology as described in this chapter, and details of each stage of the research, as indicated in the boxes, can be found in relevant chapters of the thesis.

Having determined the research methodology for the thesis, the next four chapters (Chapters 6 – 9), which are key to this research, present detailed empirical research investigations. The purpose of these investigations has been to provide practical insights into the initial evaluative framework presented in Chapter 4, and the outcome of the empirical research is a sequence of revised evaluation frameworks, culminating in a final framework, given in Chapter 9. This final framework aims to encompass some of the complexity of information strategy development and implementation within an HEI.
The aim and objectives of the research (Chapter 1)

Theoretical literature (Chapter 2)

Empirical literature (Chapter 3)

Secondary data collection

An initial evaluation Framework (Chapter 4)

Critique, analysis & findings

Defining empirical research methods (Chapter 5)

Action Research

Ethnography I

Ethnography II

Case study

Primary data collection (Chapters 6-9)

Data analysis, triangulation & findings (Chapters 6-9)

Critical reflections to refine the Framework (Chapters 6-9)

Final framework, critique of the study and further research (Chapter 10)

Figure 5.5 Research Methodology for this Study
CHAPTER 6

ACTION RESEARCH – INVESTIGATING
A STUDENT RECORDS SYSTEM
CHAPTER 6

ACTION RESEARCH – INVESTIGATING A STUDENT RECORDS SYSTEM

6.1 Introduction

This chapter describes the investigation of a Student Records System at a UK university. The main aim of this investigation is to provide an operational background to the research of this thesis and to gain a deeper understanding of the main processes involved in the development and implementation of information strategies within HEIs. Action research (AR) was chosen for this investigation.

The contents covered in this chapter include: background of the selected institution, the reasons for using AR, design of the AR, data collection process, data analysis, findings from the investigation, indications for improving the system, critical reflections on the AR, the AR perspective, summary and conclusions. Next we begin with a brief description of the university where the investigation was carried out.

6.2 Background of the Selected Institution

This is a medium-sized university with three academic faculties - Business School, the Faculty of Creative Art and Technologies, and the Faculty of Health and Social Sciences. Altogether there is a total of 11 academic departments. There are also seven education and research centres. These are illustrated in Figure 6.1. This university has its two main campuses in the town centre, one in the suburbs of the town, and there are a number of satellite campuses in other towns in the region.
The university gained its university status in 1993, and in the subsequent years underwent extensive change. A recent key change was adoption by the university of a modular degree structure, which was radically different from the previous course-based structure. The latter had programmes of study taught throughout a three-term academic year, courses were located within a faculty, and over a number of years students had to take and pass the tests of the defined courses to gain the given award. The new modular structure has allowed students to compile their own programmes of study. They can access courses across departments and faculties and modules are taught and examined in a single semester within a two-semester academic year.

**THE ACTION RESEARCH UNIVERSITY**

![Diagram of the academic structure of the action research University](image)

During previous years the university had changed its organizational structure on several occasions. Over time there had also been an increased demand for information to support the university’s management and increased numbers and types of users making demands upon the university’s information systems.
Over the same period the university had to contend with rapidly expanding student numbers; student numbers increased ten times from about 1,200 in 1993/94 to over 12,000 in 1999/2000. Simultaneously new activities became part of the HE scene. Quality assurance mechanisms, subject reviews, institutional audits, programme specifications, more detailed statistical returns, and student loans all meant the volume of management and administrative work being done in the university was significantly greater than in the past. These tasks and projects demanded improvements in information systems.

Such changes, in information systems terms, required the creation and maintenance of far greater numbers of data items than before, and the introduction of many new processes to handle them. Moreover, there were considerable new pressures of time. Faculties and departments became suddenly dependent upon each other for data, but users were still left with local systems which were not designed for new tasks. It was against this background that the development of the information strategy at the university took place (This is discussed in Chapter 7).

Having given background information of the institution investigated, the next section explains the reason why action research (AR) was considered as a suitable research method for this investigation. The problem situation of the research area and the main objectives of the AR are also described.

### 6.3 Why Action Research for this Investigation

The student records system (SRS) had played a very important role in the management of information in this university, but it had shown a variety of problems and had generated a lot of complaints from the system users on such issues as the low quality, inefficiency, and frequent errors. The system had often failed to meet the basic needs of both internal and external information provision. The problems with the SRS were so serious that some members of the university said the system caused ‘disaster’ to the university. As a result, the SRS had become a focus of strategic management attention at this university. Since the researcher was aware of this and thought there would be a good potential to make
a research contribution, the SRS become one of the empirical research investigations for this study.

The main objectives of this AR were to understand the important issues involved in the management of the SRS, identify problems with the system, trace both the immediate and deeper causes for these problems, suggest solutions for improving or changing the system and provide the research context for the second piece of empirical work of this study – the investigation of the process of an information strategy development at the same university (see Chapter 7). In addition, this investigation provided an opportunity for using the initial evaluation framework for information strategy presented in Chapter 4 (see figure 4.7 on page 142) to critically reflect on the investigation results. In turn, the investigation was expected to add insight into elements of the framework.

To investigate the problems with the SRS, the researcher had to learn how the system worked, how the main players in the system behaved and why they behaved in the way they did, who were the real decision-makers for the system, and so on. The implication of Kant’s view (see Section 2.3) for this investigation is that if we are to deal with a real-world problem situation, in this example to address problems with the SRS, we must access the reality of the situation through people’s perceptions and thoughts about that reality. Human-centered methods should are required to uncover the knowledge, motivations, and social settings of those involved in the situation being studied.

In the context, the researcher felt it was necessary to learn about the organisation to be considered as a ‘system’. And following Easterby-Smith et al. (1991) to learn about an organisation will be achieved best in attempting to change it and that those involved in implementing changes and those affected by changes should become involved in the research process. To achieve this, AR appeared to be a suitable research strategy, because, as defined in chapter 5 (section 5.3.1), AR aims to ‘combine the practical concerns of people in an immediate problematic situation with the goals of social science’ (Ragsdell, 1998). As its prime role, AR attempts to investigate and plan changes in social systems. It has an action and change orientation, a focus on the problem, genuine participation with the people involved in the research process and collaboration.
among participants. This AR was planned to make an attempt to obtain practical results of value to the groups involved while at the same time adding to the body of theoretical knowledge.

Next we look at the design of the AR.

### 6.4 Design of this Action Research

As illustrated earlier in Chapter 5 (Section 5.4), Maxwell’s (1996) model was used for the research design of this thesis, and the main components designed for each of the investigations are presented in Table 5.3 of Chapter 5. Regarding the investigation of the SRS, the key ideas for the five design components proposed by Maxwell - Purposes, Conceptual Context, Research Question, Methods and Validity, are highlighted in Table 6.1 here.

**Table 6.1 Design Components for the Investigation of the SRS**

<table>
<thead>
<tr>
<th>Components</th>
<th>Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purposes</td>
<td>Provide a context for the development of an evaluative framework for information strategies in HEIs.</td>
</tr>
<tr>
<td>Conceptual Context</td>
<td>Serious problems in information provision were identified with the SRS at the selected university; it was considering a new SRS.</td>
</tr>
<tr>
<td>Research Question</td>
<td>Identify problems, analyse causes, and suggest solutions for improving or changing the system.</td>
</tr>
<tr>
<td>Methods</td>
<td>Use action research; review documents; act as a system user; design questionnaire; conduct semi-structured interviews; report the findings.</td>
</tr>
<tr>
<td>Validity</td>
<td>Consult experts; check results with respondents; confirm findings with daily users of the system.</td>
</tr>
</tbody>
</table>

Among these components, *Methods* are the ‘key’ to reach the objectives of the investigation. Within this AR, the main methods used included: document review; acting as a system user, conducting conversations, discussions and semi-structured interviews with other users of the SRS; interventions with problems and concerns of co-workers, and feedback and liaison with the more senior management staff. To improve the research validity, the researcher checked
results with the respondents, confirmed findings with daily users of the SRS, and triangulated the data with another investigator of the system. The findings from the AR were formally fed into the university's information strategy development process via the university’s Information Strategy Steering Group. Details of this are presented in the second investigation of this research (see Chapter 7).

6.5. Data Collection Process

6.5.1 Document Review

To prepare for the investigation of the SRS and to gain background knowledge of the system this researcher collected a number of the university’s available documents and electronic publications relevant to the SRS. These included the University’s five-year Strategic Plan, Academic Information Management System - Draft User Requirements; IT Standards and Procedures; Academic Computing Services; Administrative Computing Services; The Academic and Disciplinary Regulations for Students; and Quality Assurance Handbook. Having reviewed these documents, the researcher had a general view about the system in use, and was better prepared for further investigation into the SRS.

6.5.2 Acting as a System User

To assist in investigating the SRS, the researcher gained access to the SRS by acting as data input assistant, and thus for two weeks worked on the student enrolment for the academic year 1999/2000. That year’s enrolment used the SRS that was put into operation during the summer of 1999. The task of the researcher was that of entering student information onto this SRS. By working as a system-operator the researcher acquired knowledge of the system – its main functions, its problems, frustrations experienced by system users, and even some of the main causes for the problems. Findings from this experience are discussed later in this chapter. The experience of acting as a user of the SRS provided the researcher
with useful ‘hands-on’ information about the system, and an additional point of contact for following up the subsequent interviews.

6.5.3 Using the Questionnaire

Having drawn on documented background information about the SRS, and discussed with colleagues working on the system during the two weeks as a data-enterer, the researcher prepared a questionnaire with ten basic questions designed for conducting semi-structured interviews (Table 6.2). The questionnaire was to be used as a tool for eliciting various opinions about the system from those who were involved in, or affected by, the SRS across the university. In designing the questionnaire, care was taken to keep the questions as simple as possible and to avoid the opportunity for ambiguous answers while allowing some flexibility in conducting the interviews with individual participants.

Table 6.2 Questionnaire for Semi-Structured Interviews on the SRS

<table>
<thead>
<tr>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What do you think should be the main functions of the Student Records</td>
</tr>
<tr>
<td>System?</td>
</tr>
<tr>
<td>2. What do you use the SRS for?</td>
</tr>
<tr>
<td>3. What do you like about the system?</td>
</tr>
<tr>
<td>4. What are your main complaints about it?</td>
</tr>
<tr>
<td>5. How easily can you access the information required for Subject/Department Review? If this is not easy, what other sources of information do you use in relation to student records?</td>
</tr>
<tr>
<td>6. How far did the information available on the system reflect the information you required for managing various programs/projects?</td>
</tr>
<tr>
<td>7. What do you think we ought to do to manage the input and output of the system?</td>
</tr>
<tr>
<td>8. What training has been provided to you for using the system?</td>
</tr>
<tr>
<td>9. Where do you go if you have to resolve problems with the system?</td>
</tr>
<tr>
<td>10. How do you think the system should be managed?</td>
</tr>
</tbody>
</table>
The questionnaire was sent to selected correspondents with a covering letter (Table 6.3).

Table 6.3 A Covering Letter Sent with the Questionnaire

Dear Mr/Mrs

I am a PhD student at Luton Business School. As part of my research, I need to understand issues related to the university’s student records system. The questionnaire below is designed as a guideline for me to conduct semi-structured interviews with the users of the system. You do not need to answer the questions immediately, as they are to be used as the basis of a subsequent interview, for which I will make an appointment with you. I would appreciate if you could read these questions and make some preparation beforehand so that more solid information about the system can be gained to help validate this research.

In return for your assistance, I will be happy to supply you with the results from this investigation if you wish to see them.

If you have any questions regarding the questionnaire I can be contacted by phone on 01582 743194 or Ext. 3194; or by e-mail to yong.nie@luton.ac.uk

All the information you supply will be used for academic purposes only and remain confidential. Thank you in advance for your assistance.

Regards,
Yongmei Nie

6.5.4 Contacting Respondents

Once ready, 60 copies of the questionnaire (with the covering letter) were handed out, or sent via internal post, to selected users of the SRS within the university one week before further contacts were made with the recipients. Those selected as the potential interviewees were recommended by colleagues on the
basis that they had expressed an interest in, or a concern about, the operation of the SRS. As shown in Table 6.2, the letter explained that the questions were not to be answered directly, but would be the basis of a subsequent interview. It was intended that by allowing potential respondents a certain amount of time to read the questionnaire and prepare for the interview beforehand, more reliable and considered information could be obtained during the interview stage. Overall, there was the opportunity to follow up 32 of these questionnaires on a face-to-face base. See the next section.

**6.5.5 Conducting Semi-Structured Interviews**

During the two weeks working as a system user, the researcher took part in many conversations with other system-users, including system managers and administrators, as well as other co-workers concerning aspects of the SRS. In addition, before, during and after this period 32 members of staff from across the university were interviewed to elicit their views about the system. The interviews were structured by the questionnaire (see Table 6.2) sent to them beforehand, and each interview lasted for about twenty minutes. A list of the people interviewed for this study is given in Appendix F.

Most of the interviews were conducted during the two-week period, though the whole process of the interviews lasted over half a year for various reasons. In terms of each interview, although the main aim was to elicit specific facts, there was a desire to ‘get below the surface’ in a critical systems thinking sense (e.g. questions 5, and 7). As the questionnaire made clear ‘ought’/‘should’ questions were asked (e.g. questions 1, 7, and 10) as well as ‘is’ questions. The questions also intended to raise issues to do with hierarchy, control, and sense of empowerment within the system (e.g. questions 1, 4, 5, 7, and 10). Most of those who were willing to give an interview appeared to be interested in talking about the system, and some became quite animated.
6.6 Data Analysis

6.6.1 Introduction

As this was a qualitative research with its data derived from documentation, observation notes, interviews, and other ad hoc bits and pieces, it quickly generated a fairly large amount of unstructured text data which was not easy to manage. However, as discussed in Chapter 5, the 'interactive model for qualitative data analysis' proposed by Huberman and Mathew (1994) was found very useful, as it facilitated the data analysis of the AR.

Based on this model, the researcher analysed the data collected from this research in three linked sub-processes – data reduction, data display, and conclusion drawing/verifying. These are achieved by the following procedures.

6.6.2 Making Full and Summarised Interview Transcripts

In analysing the data from interviews, for example, at the data reduction stage, a full transcript was made of the issues discussed at each of the interviews. A sample of such a transcript is given in Table 6.4 below.

Table 6.4 An Example of a Full Interview Transcript

<table>
<thead>
<tr>
<th>Action Research</th>
<th>Re: Interview Transcript for Reference No. SRS992019</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What do you think are the main functions of the Student Record System (SRS)?</td>
<td></td>
</tr>
<tr>
<td>• (Skipped)</td>
<td></td>
</tr>
<tr>
<td>2. What do you use the SRS for?</td>
<td></td>
</tr>
<tr>
<td>• Input data to admit students or to look up information to make a decision on an offer.</td>
<td></td>
</tr>
<tr>
<td>3. What do you like about the system?</td>
<td></td>
</tr>
<tr>
<td>• The new EMIS admissions software provides a good tracking facility to enable an audit trail to be produced of everything entered on the system. It lists when information was entered and by whom so incorrect offers can be traced to a person.</td>
<td></td>
</tr>
<tr>
<td>• It also records whether information has been acknowledged by UCAS. It keeps a record of everything that has been sent to a student. This is really useful and is a new feature which was not available with the HEMIS system.</td>
<td></td>
</tr>
</tbody>
</table>
4. What are your main complaints about it?

- It has taken a year to overcome the problems experienced with the new system but it is still slow. With HEMIS, 100 offers from information that had been downloaded from UCAS could be made in a shorter period of time. Staff who are inputting the data into EMIS now have to go into three different screens to generate an offer which has slowed the process considerably. The standard letter package is also very slow and cannot cope with large numbers.

- There are many duplicate student records and the problem probably lies at the admitting stage. EMIS does pick up duplicates but allows the user to make a duplicate record even though it provides a warning that a duplicate may exist. There is no stop on the field. In order to make an offer, there is a tendency for the user to create a new record rather than investigating why there is a duplicate. The system should stop the user from making an offer if a duplicate exists.

- On the new clearing screens there is not a field to enter A-level points although this was present on the system used last year. The user must ask the applicant for this information but there is nowhere for it to be recorded which is a major problem. Admission did ask ACS to customise the software to provide a mandatory field but this was not done.

- A major problem is having to use different systems for different functions, namely EMIS for admissions and HEMIS for the student record system. Users who are not based in the Admission Department will not experience this problem as they get the admissions information transferred across to HEMIS.

5. How easily can you access the information required for Subject/Department Review? If this is not easy, what other sources of information do you use in relation to student records?

- Admissions keep their own database for some details. An Access database is used to record current offers being made as the upgrade from EMIS was not ready and it was necessary to revert to a manual system. The original paper copy of the application form is retained for three years.

6. How far does the information available on the system reflect the information you require for managing various programs/projects?

- The information required to teach modules/manage programmes/produce annual reports is present on the system but it is a question of accessibility and it is not clear how to produce a non-standard report.

7. How do you think we ought to do to manage the input and output of the system?

- It is also not clear who is responsible for providing data. The system is used on a trial and error basis. If data is incorrect for HESA returns then it is because nobody has ever said what was needed in the first place.

(Who do you think ought to specify what information is needed and how it should be presented?)

- There needs to be input from a number of different departments as there are certain reports that are not university-wide. The university’s Head of Statistics should communicate what data is required in the first instance and then additional requests from the users should be added.
8. What training has been provided to you for using the system?
- I cannot remember having any training.

9. Where do you go if you have to resolve problems with the system?
- There is no one person to contact to resolve queries with the SRS. The person who is approached depends on the problem. With a system problem it is often a guessing game about whether it is Academic Computing Services or Networks. There should be a list of contact names for specific problems with the system.

10. How do you think the system should be managed?
- A central office with clear lines of communication so that staff know where to go for reports and assistance.

Once full transcripts of these interviews were made, individual summaries were drawn of the key issues discussed at the interviews. A sample of a summarized interview transcript is given in Table 6.5 below.

The two examples of full and summarised interview transcripts indicate typical responses. A selection of a wider range of responses was given in Appendix G while full transcripts and individual summaries of all the interviews are available from the researcher.
Table 6.5 A Sample of a Summarised Interview Transcript

**Action Research**

**Transcript Summary for Reference No. SRS992017**

1. Reports are never accompanied by definitions of the data. Every report presents information in a slightly different way. Sometimes reports show the distinction between home/overseas or part-time/full-time students. Often it is not clear whether the totals are for FTEs or student bodies or whether students on combined programmes or franchise students are included.

2. Three reports purporting to provide enrolment figures were received last week. The Business School had a range of 450-600 students depending on which report was consulted. The consequence is nobody trusts any data provided from the SRS.

3. An individual student transcript is currently produced for every student in the Business School and manually checked to ensure that students are enrolled on the right number of modules including the cores. This should be unnecessary as the system should be able to record what modules are core for each programme and produce an exception report for any students who do not meet the requirements. The SRS also does not prevent prohibited combinations.

4. There are conflicts between the University’s physical systems and its information systems. Students register on modules too late to enable module lists to be produced early enough for proper planning and allocation to tutorial groups. The University should work harder to ensure returning students provisionally choose their modules before they leave at the end of the academic year. It is more difficult for first year students to choose their modules in advance because the system is complicated and they need to be talked through their module choice at induction.

5. The way that the University approaches system problems is completely wrong as it takes a narrow systems point of view rather than a holistic systems view. It fails to see the way people relate to each other and the cultural problems and barriers that exist.

6. American universities employ institutional statisticians and have whole departments who do research on their students. The university should utilise its existing resources in terms of lecturers who could produce research on student behaviour or who could use the table data in the system to produce more reliable information.

7. The University should not try to be too clever about what it wants to do over the next couple of years. It should listen to the views of the users and be realistic. The basic system needs to be able to work first.

8. The Centre needs to produce some basic sets of information that are accurate. Local users can then manipulate this data as they see fit.

9. Abandoning the system and starting again would be foolish unless the present system runs in parallel.
6.6.3 Categorising Key Issues Identified

Based on the transcript summaries, the key issues identified were then categorized - thirty-seven categories in total, with each generally being mentioned by a number (and sometimes many) of the interviewees. Then typical examples given by the respondents were listed for each category and where appropriate possible causes for the problems were identified and solutions suggested. The full set of these categorised key findings is displayed in table format in Appendix H.

6.7 Key Findings from the Investigation of the SRS

This section presents the main findings on the SRS, drawn from the categorised database of Appendix H. These findings are presented under four subtitles: a summary of the key functions of the system, complimentary remarks about the system, main problems identified with the system, and immediate causes for the problems.

6.7.1 Key Functions of the System

A student records system is supposed to be able to provide the basic information about its students on the system, so as to meet academic and non-academic needs, and internal and external requirements. Specifically, a SRS, to a minimum extent, should have the following key functions:

1. Record information about students, including: register applications, and application decisions made by the university; enrol students of all levels on courses; look up personal details on individual students; maintain the assessment grades; and record students' progress at the university.

2. Facilitate student administration, including: generate students' ID numbers; check students' enrolments, programmes, module choices, and fees; set up module and programme codes in the study block tables and map them against UCAS codes; track applications from international students, and
print reports on their admissions and enrolments; set up non-standard fees; generate examination timetables; and maintain the assessment database.

(3) Assist academic activities, including: produce course lists and module lists; generate student transcripts and reports to examination boards; look at student grades in relation to progression and support advice to students with Fail and Negotiated Progression decisions; print and use student transcripts to support advice in relation to student disciplinary procedures, grievances, complaints and fee-waiver applications.

(4) Provide information for external organizations, including: produce returns to HESA and HEFCE; provide progression grades for LEA (Local Education Authorities); provide information for interrogation on behalf of other universities; use student transcripts to produce references and certificates for students.

(5) Provide information for decision making, including: access information to make a decision on an offer; produce a report on the Faculty’s enrolment totals and full time equivalents for budget purposes; obtain summary statistics of the number of FTEs on modules and fields; obtain the student profile to provide an overview of the student; use the system for management information and for student numbers to assist project planning and to acquire statistics for Department Review; and record whether information has been acknowledged by UCAS.

6.7.2 Complimentary Remarks about the System

A number of positive remarks were made about the student records system (SRS). While it is true that the system functioned and provided much useful data, it is also notable, in a ‘systems thinking’ sense, that most of the complimentary remarks were from respondents with a responsibility for the system, such as systems development managers, the SRS analysts and programmers, and the computer services providers. Some of the complimentary remarks are summarised below, with where applicable comments by the researcher to put the remarks into context.
Remark 1:

"The system is versatile'. E.g. 'One can generally find basic information straight away, and reports are generally well presented.'

Reference No.: SRS-992008

The researcher’s comments:

The system could, and was supposed to be able to, provide a lot of information, but using the word 'versatile' was over-stated, as many complaints were heard about inflexibility in the presentation of reports.

Remark 2:

"When it works properly, the system provides accurate information in an acceptable format."

Reference No.: SRS-992002

The researcher’s comments:

This implied that the system did not always work properly, and thus it did not always 'provide accurate information in an acceptable format'.

Remark 3:

"The final examination board reports contain information on the decisions options available, and this only needs the decisions to be circled."

Reference No.: SRS-992023

The researcher’s comments:

However, some users said that there had to be working definitions to go with the reports for ‘decisions options’ terms available.

Remarks 4 & 5:

"The system is relatively easy to use. For example, it was relatively easy to call up a student record by entering the student’s name or ID number, or by putting in the first few letters of a student's name."

"It was possible to get the basic information that was needed, e.g. name, addresses and contact details. 'The pop-up menu facility used to assist data entry was felt to be particularly useful.'

Reference No.: SRS-992004
The researcher’s comments:

Aren’t these the very basic functions of such a system?

Remark 6:

“The system is flexible. For example, there is a separate standard letter-package, and different versions of letters can be requested when an offer is made. It is possible to run an update of a standard letter and this is also indicated on the individual student record. It is possible to print an application summary by country and break down this information into names, course and faculty.”

Reference No.: SRS-992023

The researcher’s comments:

Yes, in theory, it was possible for the system to do all the things listed above, and possibly more. However, since most of the users of the SRS had not been formally informed of such facilities, they failed to use the system at the maximum capacity.

Remark 7:

“The system provides useful information. For example, it provides a good tracking facility to enable an audit trail to be produced of everything entered on the system. It is possible to view the assessment history of a student and to instantaneously print a student transcript. It keeps a record of everything that had been sent to a student, such as an open day letter and the date that it was sent.”

Reference No.: SRS-992023

The researcher’s comments:

Again, not all this information had been passed to the system users, though some users did pick up bits and pieces of such information mainly by their long experience of working on the system.

6.7.3 Problems Identified with the System

Through the interviews on the SRS, many problems were identified with the system. A detailed list of the main problems raised at these interviews is given
in Appendix I while the following places the key problems into five broad classifications, each with a number of examples given by respondents interviewed. These problems were then analysed and the immediate causes for the problem identified, with the main proximate causes presented in Section 6.7.3. (Note that deeper causes for some of these problems are discussed under ‘critical reflection’, in Section 6.9)

(1) The system produced incorrect information. Examples included:

"At examination boards there were always a high number of students recorded as 'non-attempts', where these students had not in fact attended the modules listed."
Reference No.: SRS-992002

"The system reported that students had not submitted a piece of work, but where the students were able to produce a receipt (from the University's Modular Office) of the work submitted."
Reference No.: SRS-992005

"Students contacted the university because they received standard letters regarding absence, but they had graduated several years previously."
Reference No.: SRS-992010

"Information was sent to students at the wrong addresses, to students who had withdrawn from the university, and to those who had never commenced a course."
Reference No.: SRS-992017

"Reports provided for examination boards often contained many errors, and thus had to be gone through individually based on the lecturers' notes on hard copy to make sure the information was accurate."
Reference No.: SRS-992014

(2) The system produced ambiguous or unsatisfactory information. Examples included:

"There was no distinction provided on the system between a fail for a referral student who submitted work of poor quality, and a fail for non-submission."
Reference No.: SRS-992020

"The system was not able to prevent more than 8 modules being entered for a student, and one student was found to have enrolled on 17 modules!"
Reference No.: SRS-992021
"Serious problems were caused over the summer of 1999 with Quality Assurance clearing-up of programme codes. Some courses disappeared from the system, and student numbers fluctuated."

Reference No.: SRS-992020

(3) The system failed to provide sufficient information about the student. Examples included:

"The student's degree classification was not printed on the final transcript. It was also not possible to access the classification result of a student from a previous year. Staff had to refer to paper-based examination reports to write references for students."

Reference No.: SRS-992013

"It was not possible to obtain information about a whole cohort of students on a programme. And very often the basic information about the current status of the student was not available. For instance, whether they were current, withdrawn, or completed; home or overseas, what the weightings were for each assessment, and the number of assessment points, whether the student was taking each module as a core or option; whether the student numbers were FTEs (full time equivalents) or full time."

Reference No.: SRS-992017

"No information was carried about a student's other qualifications, age, ethnicity, and so on. And it was not possible to keep a record on the SRS of maternity or long-term sickness breaks."

Reference No.: SRS-992029

(4) The system failed to provide information required for some key academic activities. Examples included:

"Information such as HESA (Higher Education Statistics Agency) returns was not made available to staff from the system."

Reference No.: SRS-992028

"The SRS could not be used by some departments of the university, such as the LCB (Language and Culture for Business) or the University's Research Centre, for any purpose other than the generation of an ID number. For the Research Centre, the statistics needed for the annual report (to the University Research Degrees Committee) on completion rates, the length of time needed for a PhD, withdrawals, transfers, etc., had to be calculated manually. And there was no information from the system about the research grants that the university received and details about how much, who for, and from whom."

Reference No.: SRS-992029
“Module numbers and lists were provided too late to assist with timetabling and the production of lecture materials.”
Reference No.: SRS-992007

“Accurate information on progression rates was required for the Annual Course Monitoring Reports, but this had never been provided. It was necessary for the Field Manager to use the examination board reports to calculate the information on progression manually.”
Reference No.: SRS-992028

(5) The system failed to record core data required for HESA returns, HEFCE research, and subject review. Examples included:

“When making returns to HEFCE the number of students included on the return and recorded on the SRS did not match.”
Reference No.: SRS-992028

“Basic information such as ‘unit of assessment’ which had to be included in the return to HEFCE was not recorded.”
Reference No.: SRS-992028

“A-level points and occupational codes were not available on the system.”
Reference No.: SRS-992017

Note that while the majority of the findings on the SRS outlined above were identified by the discussions and interviews carried out for this research project, for completeness the results of a separate investigation by the Coordinator of the information strategy development project at the university investigated are also referred to.

6.7.4 Immediate Causes for the Problems

The investigation of the SRS not only revealed many problems with the system, but also, through further analysis of the interviewees’ responses, led to the identification of the main proximate causes for the problems. These are listed below in four broad categories.
A. Lack of system specification and poor data quality

There was no central person to contact to resolve queries with the SRS and there were no validation routines, and no central definitions for the codes used in standard reports. For example, no clear definitions were given on whether the totals were for FTEs or real student numbers, nor whether students on combined programs and franchise students should be included. The File Transfer Programme (FTP) was complicated, and there were no written guidelines.

There was little verification on the system. Low quality data were entered in the system - missing data, missing fields, and duplicate data. There were even inaccuracies in the basic list of modules that were being run in the academic year. Too many people, including the temporary staff without proper training, were involved in entering data onto the system, especial during the enrolment period.

B. Inflexibility of the system

The SRS did not meet the needs of short-term projects, or non-standard courses. The system was not made flexible enough to accommodate all the information that needed to be stored. For example, the SRS did not provide adequate information required by professional bodies. It only recorded the current status of students. So no historical view was available. No space had been created in the system to record information on students for previous years, and no place to record such information as results of external examinations or students' grades for individual assignments.

An overall grade for a module after referral was not provided on student transcripts and examination board reports. Student progression decision and final degree classification were not included on a student's printed transcript.

There was a tight schedule for exam boards but the system was unable to cope, particularly with irregular pathways, and it frequently calculated classifications incorrectly. Problems usually occurred when students were repeating modules.
C. Lack of communication within the system

Information was held locally – normally one person held all the knowledge for a particular task. However, there was no timely communication between different sections or departments of the university. For example, there was a lack of communication between the staff who provided the HESA returns and the information for HEFCE research, and those who entered the data.

There was also a lack of consultation with users. For example, courses were once re-coded by Quality Assurance without any consultation. As a result codes for the same level and sometimes even for the same course were duplicated. Users were not informed of changes to, and development of, the SRS, and of the scope to access the system to its full potential. Many staff, for example, did not know that file transfer was possible with the system.

Every time somebody changed a module on the SRS, it complicated the student ledger. However, the staff that were entering data and changing modules was not informed of the impact of their actions.

The procedure for student withdrawals and changes of their addresses had not been communicated to relevant staff. Therefore, effort had been wasted in sending information/letters to students who had withdrawn from the university and to students’ old addresses.

D Poor system management

There was no continuity about the way information was handled in different years. Major changes were frequently made to the system just before key activities, such as clearing, enrolment, and examination boards, which often resulted in reports not working properly because no time was available for the system to be tested after these changes.

Effort was wasted for creating duplicates of the same information at various levels, sections, or departments within the university.

In addition, the system did not fit well with other systems that the university was using.
6.8 Indications for Improving the System

After an examination of the above immediate causes for the problems identified with the SRS, suggestions were recommended as to what ought to be done to improve the SRS. Subsequent improvements to the system were based, to a certain extent, on these suggestions.

6.8.1 To Improve the Quality of Data

It is imperative that the information recorded be accurate. To do so, a central core of trained staff with a thorough understanding of the SRS, and preferably with an academic background, needs to be empowered to conduct the student enrolment rather than to recruit two-week temporary data-entry staff with little training for the annual student enrolment activities. The provision of training for users ought to be included as an integral part of plans for the implementation or enhancement of any institution-wide system. And to improve the data quality on the system, errors should be corrected at data entry level.

6.8.2 To Improve the System

The main purpose of the SRS is to serve as a database to keep an accurate record of every student registered, what they have achieved in the past and what they are doing at the present. So it is important to persuade the systems managers that it is imperative that appropriate fields be created to provide a complete ‘fresher to graduate’ record of the student that is easily comprehensible to the system users.

There should also be a compulsory summary transcript on the system which holds basic information about every student. Updated information on students such as the module pass rates, pass rates after referral, progression decisions, final degree classifications and their current status also ought to be
entered on to the system as soon as possible after referral examination boards to provide a complete picture.

6.8.3 To Improve the Flexibility and Accessibility of the System

Although most of the students in the university had followed a conventional full-time undergraduate pattern, evidence showed that there was an increasing number of students who did not, and the range of learning patterns which they followed were increasingly diverse. These learning patterns ought to be accommodated within flexible administrative systems. *Ad-hoc* systems cannot be relied upon to deal with special cases which depart from the norm, as had often been the case: these proved to introduce errors and are not cost-effective.

The system should be enabled to produce tutorial lists for modules, track student attendance, remove duplicate fields, and prevent conflicting information from being entered. Former student records should continue to be treated as ‘live’ records, and attempts made to continually update the contact details.

Links ought to be created between the SRS and other key systems in the university, such as the Library System, the Finance and Personnel systems. Links should also be created between the SRS and relevant external systems to facilitate the information availability and data transfer process. For example, the university ought to be enabled to transfer information available from UCAS to the SRS. A person or team ought to be empowered to oversee the system, and make sure it is clear whom to inform if there is a problem.

To work more efficiently, the system needs to be sized correctly in terms of hardware and software, and be evaluated against predicted level of use. It was often the case that before the internal and external exam boards at the end of each semester, the SRS was often found inefficient and there was difficulty in producing timely printouts/reports that were required for the exam boards.
6.8.4 To Improve Communications about the SRS

To improve communications about the SRS, ongoing consultation ought to be encouraged between individual faculties, departments, and users from across the university. For example, system users ought to be able to notify the university’s Academic Computing Services of typical problems so that the causes for the problems might be identified and rectified. In addition, before any new information system is introduced, the university should conduct a review of the processes that support the collection and use of the underlying data to ensure that it provides good value for money.

The above are some straightforward suggestions to address mainly technical aspects of the problems with the SRS. Deeper causes for the problems with the SRS are discussed and reflections made in the section below.

6.9 Critical Reflections from the Action Research

6.9.1 Reflections on the Evaluative Framework Drawn from the Action Research

Analysing the problems with the SRS has given considerable insight into specific areas within the evaluative framework of Chapter 4 (refer to Figure 4.7). Aspects of the SRS problems can be tied back to specific elements in the framework and the corresponding analytic approaches and system methodologies considered. In particular, because the SRS was a system already in place, it is primarily in the areas of ‘internal environment analysis’ that lessons can be drawn. Comments are made in the following subsections on four of the elements in this category to indicate reflections based on the action research (AR). These elements are: organizational culture, information needs analysis, managing strategic change, and evaluative structures.
A. Organizational Culture

The widespread and on-going SRS failings as indicated earlier in the ‘findings’ section of this chapter reflected significant problems within the organisation’s culture. At the university people were encountering problems on a daily basis, but were either not motivated to, or prevented from, getting these addressed. The prevailing culture was one of ‘moan about problems’ to oneself or colleagues, and ‘muddle through’, rather than actively highlight problems when they occur and seek cooperation to get them resolved. Some of the issues raised with the system were operational, and could be remedied relatively easily. But many of the issues identified were more strategic in nature and required a more over-arching plan if they were to be addressed. (This helped, incidentally, confirm the notion that a coherent approach, i.e. using critical systems thinking ideas, to the development of an information strategy across the university would be valuable.) In the case of its SRS, it was clear that whilst it was seen within the university as a ‘strategic system’, it largely lacked strategic focus within the institution, with the result that the operational issues were often poorly dealt with. Specifically, links to other systems, human issues, and general long-term planning all emerged as factors in need of more concentrated attention. Overall, the SRS was identified as a system, as Clarke (2001a) said, where ‘operational issues took priority over strategic issues’ and it seemed that those involved were falling down on the operational issues too.

B. Information Needs Analysis

Within the SRS, it was clear that the information needs analysis was either very poorly done or out of date: key information was missing, and the information available often unreliable. One can well understand some of the contributing factors for this, including reliance on a ‘bought-in’ package; increased student numbers, course modules, and module combinations; and increased reporting requirements, both internally and externally. But the SRS failures pointed to the need that a more comprehensive participative information needs analysis ought to
be carried out, with people representing various areas and departments of the university being included and encouraged to express their views on the university’s key information needs as a whole. Section 4.3.4 and Appendix E indicate the relevant methodologies that could have been used.

Regarding the topic on ‘information needs analysis’, detailed description is given later in Section 8.3. This describes the researcher’s experience in participating in information needs analysis at JISC workshops on information strategy. Examples of ‘what’ and ‘how’ to conduct the analysis are given to demonstrate the analysis process.

C. Managing Strategic Change

Managing strategic change was another area where well-established approaches were not being employed. On a technical front major changes to the SRS were being introduced without adequate (or sometimes any) parallel running, while on the human front changes were being implemented without adequate discussion or training of staff. In broader terms, strategy was being dictated from the top, and little attempt was being made to allow for ‘emergent’ strategy formation.

In terms of this aspect, the solutions to the problems of the SRS were, in general, two-fold: for the university’s management side to give more strategic attention to the running of the SRS, and for the staff working with the system to become part of a structure that allows their concerns with the system to impact its operation in a more direct way. Both approaches would more likely have been considered had a more critical systems thinking (CST) line been taken each time the system failings were identified. It is the intention of the evaluative framework of Figure 4.7 to help the process of focussing on areas where such CST might be beneficially employed.
D. Evaluative Structures

The lack of appropriate evaluative structures was apparent in the fact that the SRS failures had become chronic, and were not picked up and addressed in any systematic way. Although serious complaints about the system were being heard all the time from the system’s daily users, little had been done to improve the system, as the decision makers of the university had not realised, or were not willing to accept the problems with the SRS. In the end, as part of the university’s move towards an information strategy, it was decided that a specific study of the SRS ought to be instituted, and a formal evaluation presented that listed a wide range of individual issues, together with recommended immediate, short-term and medium-term actions, as well as the identification of strategic principles (see Forsyth, 2000). However, although all this has been very well documented, it was subsequently found that little was done to solve the problems with the systems.

In terms of the full set of the seven elements listed under ‘internal environment analysis’ in the framework (Figure 4.7), Table 6.6 provides a summary, under ‘Is’ and ‘Ought’ column headings, of some of the main issues identified within the action research investigation of the SRS.
<table>
<thead>
<tr>
<th><strong>Element</strong></th>
<th><strong>IS</strong></th>
<th><strong>Ought</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Organisational structure</td>
<td>Strategy was dictated from the top.</td>
<td>Attempt ought to be made to allow 'emergent' strategy.</td>
</tr>
<tr>
<td>Organisational culture</td>
<td>Nobody cared about addressing problems with the SRS</td>
<td>A caring and sharing culture ought to be encouraged.</td>
</tr>
<tr>
<td>Resource management</td>
<td>Inadequate resources management led to misuse or waste</td>
<td>There ought to be in place some sort of applicable resource strategy to monitor the adequate allocation or resources.</td>
</tr>
<tr>
<td>Information needs</td>
<td>Was insufficiently analysed.</td>
<td>Ought to be analysed and prioritised before any system development.</td>
</tr>
<tr>
<td>Strategic alignment</td>
<td>No alignment was made between various strategies</td>
<td>There ought to be adequate alignment between information strategy and other strategies (e.g. IT, IS, ICT, L &amp; T)</td>
</tr>
<tr>
<td>Managing strategic change</td>
<td>Changes were implemented without adequate discussion or training of staff.</td>
<td>Strategic attention ought to be paid to strategic change and wider participation ought to be included.</td>
</tr>
<tr>
<td>Evaluative structure</td>
<td>There was no appropriate evaluative structure.</td>
<td>Feasible evaluative structure ought to be established.</td>
</tr>
</tbody>
</table>

### 6.9.2 Critical Systems Thinking as Applied within the Action Research

As indicated above, it is not enough to identify some aspects within the internal environment as having an impact on the physical system being examined, but it is also necessary to critically reflect on the actual situations of potential intervention; particularly, in this case, on such aspects as organisational culture, the analysis of information needs, management of strategic change and evaluative structures. In these areas special attention should also be paid to the choice of the most appropriate analysis methodologies to be employed. The topics discussed and methods used in the present chapter are highlighted in Figure 6.2.
This figure highlights key areas informed by the action research and methodologies employed.

**Figure G.2:** Aspects of the Evaluation Framework addressed by the action research.

### CRITICAL SYSTEMS THINKING IDEAS EMBEDDED IN THE FRAMEWORK ELEMENTS

<table>
<thead>
<tr>
<th>Emancipation</th>
<th>Anxiousness</th>
<th>Pluralism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of multiple social theories</td>
<td>Understand limitations of inquiry methods</td>
<td>Multiple paradigms, critical social theories, organisational theory</td>
</tr>
<tr>
<td>Who has the power? Is this decision the truth?</td>
<td>Identifying boundary conditions, ask is and ought questions</td>
<td>Historical hermeneutic inquiry</td>
</tr>
<tr>
<td>B &amp; M's paradigms: critical social theories, organisational theory, E-SMM, SoSML, CIH, methodology, selection framework</td>
<td>Critique of ideology, assumption analysis, needs radical change</td>
<td>(see below)</td>
</tr>
</tbody>
</table>

### Resource management

- External environment analysis
- Internal environment analysis
- Competitive advantage
- Organizational structure
- Strategic alignment
- Control structures
- Monitoring
- Evaluative structures
- Implementing
- Developing
- Preparing
- Planning
- Emancipation
- Anxiousness
- Pluralism

### Organizational management

- Resource management
- Strategic alignment
- Control structures
- Evaluative structures
The findings from the SRS investigation suggested that a more critical focus be adopted within the ‘Guidelines for evaluation’ given in Chapter 4. These guidelines are intended as practical pointers to the questions to be asked and methods used for eliciting information about each of these elements within the evaluation process. From the findings of the SRS investigation these guidelines do not need to be changed in any fundamental sense, but a deeper approach to eliciting information appears warranted. Specifically, there are many ways that responses to the questions raised can be gained and suitable methods appropriate to the individual circumstances need to be chosen.

In some cases it will be clear that a question can be posed in a straightforward way to the individual or individuals involved, for example, in seeking the Information Strategy Co-ordinator’s opinion of a specific and non-controversial topic. In other cases, direct question to individuals may not reveal the full story. Two factors to consider include:

- The need for frankness. For example, questions to information users may be more revealing if made outside the hearing of the management staff.
- The need to encourage respondents to consider complex social issues.

Though most people do not think in ‘social-theoretical’ terms, nearly everyone has some of the underlying concepts as part of their everyday experience. For example, the following attitudes were typical of the responses one might expect to hear when investigating an information system such as the SRS:

- ‘I don’t like being ordered about.’ (Issues of power, hierarchy).
- ‘I hate working hard to put information into the system that as far as I can see no-one will ever use.’ (Information needs analysis, human involvement in the decision making process).
- ‘I don’t like being responsible for the accuracy of information, if other people can come along and change what I have put in.’ (Human involvement, emancipation).
• 'I suggest ways we could improve the provision of this information, but no-one listens to me'. (Hierarchy, empowerment).

• 'As a user, there is information I clearly need, but there is no structure in place that lets me ask the data providers for this.' (Information needs analysis; organizational structure).

• 'The data are so often wrong (or late) that I have my own system for the purpose.' (Human-centred issues).

• Or worse: 'The data are so often wrong that I no longer care about getting things correct.' (Human-centred issues).

Methods for internal environment analysis, particularly information needs analysis, therefore, need to be introduced to give respondents the time and space, and probably also clues, to help them think about their roles, and consider clearly what they think is good, or otherwise, about the system, and more importantly, why they think it is successful or not. Such methods include:

- Semi-structured interviews (pointers can be given to the types of topics the investigator would like to see addressed);
- Group discussions (the investigator or perhaps the Strategy Coordinator can help focus on deeper issues);
- Role play (to uncover hierarchy and communication issues);
- Simple but well-structured surveys by mail (the latter gives respondents time to think about their replies).

Overall, the evaluator needs to obtain information on underlying causes for problems encountered in the process of implementing a HEI's information strategy.

For this action research, attempts were also made to 'link theory to practice'. While conducting the research investigation, the researcher kept in mind the underpinning theories reviewed in Chapter 2, where this background knowledge helped better understand and appreciate the viewpoints of the respondents. For example, as indicated above, the interviews on the SRS revealed two distinct sets of comments about the system. Respondents with a responsibility
for the system tended to speak highly of the system, while most ordinary system
users had various complaints about it. To draw a richer picture of the system, the
researcher therefore attempted to put herself into the shoes of the respondents, to
try to understand their background and think about the real motivations for their
responses to the questions asked.

6.10 Action Research Perspective

Action research, as a research strategy, should “combine the practical
concerns of people in the problem situation with the goals of social science”
(Ragsdell, 1998: 505-506). As an example of this involvement, the researcher
intervened in the SRS problem-solving process by acting on a number of
occasions as an independent messenger, i.e. passing concerns of the front-line
staff (those who worked on the SRS) to the university’s managers. It turned out
that some apparently trivial complaints made by the system users, with a little
effort of the researcher to pass the message upward to managers, often on
informal occasions, helped quicken the problem-solving process.

A second type of intervention was that simply the process of interviewing
the system users caused them to reflect on the problems brought about by their
daily routines, and on wider issues about SRS. For example, some data-entry staff
used to key in whatever data were available onto the system without thinking of
the output – the information retrieved from the raw data. By participating in this
investigation, they not only contributed to the research, but also became aware of
some issues about the system, including the importance of getting the data right at
the data-entry stage.

A third aspect of intervention was that the results of this action research
were reported to the university’s Information Strategy Steering Group which was
in the process of developing an information strategy for the university. This
helped make the committee realise the seriousness of the problems with the SRS,
and as a result it was decided to make further investigation into the SRS, which as
will be seen in the next chapter resulted in the purchase of a new SRS. And when
implementing the new SRS the university took into account the suggestions made from this research. In addition, it was observed that the result of these actions brought about changes to the university’s culture regarding the use of the SRS.

6.11 Summary and Conclusions

This chapter has described the first of the four empirical investigations designed for this thesis – action research, which concerned the investigation of a student records system (SRS) at a UK university. This research revealed that the SRS exhibited a range of significant failings. These included:

- Incorrect information;
- Incomplete, ambiguous or unsatisfactory information;
- A failure to provide information required for some key academic activities;
- A failure to record core data required for HESA returns, HEFCE research and subject review.

The situation was so serious that some system users said the problems had caused ‘disaster’ to the university. Analysis identified a number of proximate causes for these problems, including lack of system specification, poor data quality, poor system management, inflexibility of the system, and lack of communication about the system. The investigation of the SRS also indicated that deeper factors were at work. Many people had realised that the problems concerning the SRS were serious, but there was no agreement on the underlying causes for these problems, and there seemed subconsciously to be a culture of blame.

It was proposed that in addressing the problems of the system, the evaluative framework of Chapter 4 could be of assistance. Aspects of the SRS could be referred back to specific elements listed in the framework, and the corresponding analytic approaches and system methodologies be considered to address these problems in a holistic way. In particular, it was found that Information Needs Analysis for the SRS was very poorly done or out of date, in
that key information was missing, and the information available often unreliable. This pointed to the need for a comprehensive information needs analysis to be carried out, and the relevant section of the evaluative framework indicates several methodologies that could be used.

In addition, the 'Evaluative Structures' for the SRS were clearly inadequate as the SRS failures had become chronic, but they were not recognised or addressed in any systematic way. Moreover, it appeared that aspects of the organizational culture associated with the SRS needed change. People were experiencing system problems on a daily basis, but were not motivated to get them addressed. Some of the issues were operational and could be dealt with easily, but many issues were strategic in nature and required a more over-arching plan to resolve them. Specifically, it was suggested that the SRS was 'a system where operational issues took priority over strategic issues'.

Another area where well-established approaches were not being employed was that of strategic change. Quite often changes to the SRS were being introduced without adequate parallel running; and on the human front change was being implemented without adequate discussion or provision of staff training. Strategy was often being dictated from the top with little attempt made to allow for 'emergent' strategy formation.

In a sense, the failings of the SRS were typical of many failed information systems: agreement with a system's aims but dissatisfaction with its reality; confusion and blame about what was wrong, little attention to users' needs and poor motivation of many of those involved. To address failures of this type in the past, systems thinking had moved from 'hard' to 'soft', and the move was now gradually towards critical systems thinking.

In terms of such thinking, the investigation of the SRS suggested the need for a more critical focus in the methods of inquiry, ensuring openness in response to questions, finding ways to encourage respondents to consider more complex 'social theoretic' issues such as motivation, information ownership, hierarchy and power. Such methods include:

- Semi-structured interviews, where pointers can be given to the types of topics the investigator would like to see addressed.
• Group discussions, where again the investigator can help focus on deeper issues.
• Observation of the behaviour of people with significant roles to uncover issue of hierarchy and power.
• Simple but well-structured surveys to give respondents time to think about their replies.

Overall, the results of the action research provided useful insights to the relevant elements of the information strategy evaluative framework of Chapter 4, and, in turn, provided a basis for the study of the university's information strategy process, which is described in the next chapter.
CHAPTER 7

ETHNOGRAPHY I – PARTICIPATING IN THE PROCESS OF AN INFORMATION STRATEGY DEVELOPMENT
CHAPTER 7
ETHNOGRAPHY I – PARTICIPATING IN THE PROCESS OF AN INFORMATION STRATEGY DEVELOPMENT

7.1 Introduction

Ethnography, as defined in Chapter 5 (page 155), is a research method in which the researcher immerses himself/herself in a social setting for an extended period of time, observing behaviour, listening to what is said in conversations both between others and with the fieldworker and asking questions. Ethnography I of this thesis was concerned with the researcher’s participation in the process of an information strategy development at the same university where the Action Research was conducted (see Chapter 6). This participation consisted not only of participant observation at meetings, but also of involvement in the decision-making process, and the carrying out of a range interviews and discussions to provide a broader view of information management within the university.

The main objectives of this ethnographic research were to:

- Understand the university’s needs to develop an information strategy, and the benefits expected from doing so.
- Understand the internal and external environments for its information strategy development.
- Understand the various perspectives of those involved in and affected by the institution’s development and implementation of the information strategy.
- Identify key issues that need to be addressed when considering developing an information strategy.
Providing an opportunity to consider elements in the 'control structures' and the 'external environment' of the evaluative framework of Figure 4.7 to reflect on the ethnographic research; and in turn to add additional insight to the framework.

This investigation has primarily relied on the researcher's participation in and observation and analysis of the university's Information Strategy Steering Group meetings. It has also relied on the information gathered from the interviews and discussions with staff and students across the university.

7.2 Background of the Information Strategy Development

Two main reasons explain why the university initiated its information strategy development. The first one was that in common with most other universities, this university was faced with increased student numbers from a wider range of backgrounds and the need to adjust to new regimes of quality assurance and assessment. The university needed to find more effective and efficient ways of managing its information. The second reason was as a response to a HEFCE's request to demonstrate the extent to which the university had developed an information strategy to support teaching and learning, research, and management (JISC, 1998a).

As early as November 1998, a Professor in Information Systems at the university submitted a ‘Discussion Paper’ to the institution's Vice-Chancellor (VC) to propose the development of an information strategy at this university. This paper stressed that there was a need to define and document strategies for information, information systems (IS), and information technology (IT). It indicated that an “IT strategy cannot be determined unless the IS needs are known, but these in turn must be derived to support the need for information within the university.” (Clarke and Lehaney, 1998: 3).

In response to this ‘Discussion Paper’, one month later the VC issued an internal memorandum calling for a Computer and Data Users Group (CDUG) to
be set up; and subsequently nominated eight senior members, four Faculty Registrars and a Central Services Registrar of the university to the membership. Note that the name of the group was changed into 'Information Strategy Steering Group' (ISSG) after about six months, as the initial name was seen as not appropriately reflecting the task it was expected to do.

Working to the Guidelines (JISC, 1998b) specified by the JISC, the ISSG proposed a project approach to developing the university's information strategy, with a focus on a priority organizational issue. The committee started by reviewing the university's activities in relation to information management, and held 17 meetings between January 1999 and June 2000 (also see Table 5.4) aimed at developing and implementing an information strategy for the university. In May 2000 the first version of the Information Strategy Document was published as an internal document. However, follow-up informal inquiries of some of the information users revealed that most of these had no knowledge of such an information strategy. It is believed that the information strategy document was known only to the senior management of the university.

7.3 Why Use Ethnography?

According to Myers (1999: 2), "ethnographic research is one of the most in-depth research methods possible". Ethnography provides the researcher with rich insights into the human, social and organisational perspectives of the information strategy. For this research, because the researcher was at the research site for 18 months, and observed what people were doing as well as what they said they were doing, a deep understanding was obtained of the people, the organisation, and the broader context within which they worked. Thus, to investigate the process of an information strategy development, to find out how

1 They included: Professor in Information Systems (Chair), Director of Finance, Director of Information Services, Director of Teaching and Learning, Director of Marketing and PR, Director of Learning Resources, Head of Personnel, and Director of Modular Office.
2 The membership changed slightly half way through due to the changed positions of some members on the committee.
decisions were made and who were the people in power within the organisation on such a strategy formulation, the most suitable research method was seen as ethnography.

7.4 Design of Ethnography I

As with the action research presented in Chapter 6, Maxwell’s (1996) model or research design with its five components – purposes, conceptual context, research question, methods and validity (Figure 5.3 in Chapter 5), was also used for the design of Ethnography I. The main ideas for each of the components of this ethnographic research for investigating the process of an information strategy development are presented in Table 7.1, which is itself part of Table 5.3 of Chapter 5.

Table 7.1 Design Components for Investigating the Process of an Information Strategy Development

<table>
<thead>
<tr>
<th>Components</th>
<th>Descriptions</th>
</tr>
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<tbody>
<tr>
<td>Purposes</td>
<td>Observe how a typical HEI develops an information strategy; consider paths to such strategy implementation and approaches for evaluating such strategies.</td>
</tr>
<tr>
<td>Conceptual Context</td>
<td>JISC was working on information strategy development; the research institution had just started such a development.</td>
</tr>
<tr>
<td>Research Question</td>
<td>Identify key issues/problems in such strategy development, how decisions are reached and who holds the power.</td>
</tr>
<tr>
<td>Methods</td>
<td>Ethnographic research was used: within this the researcher participated in and observed decision-making process at the ISSG meetings, conducted in-depth interviews and wrote reports.</td>
</tr>
<tr>
<td>Validity</td>
<td>Triangulate data with other investigators/researchers, check results with the people involved.</td>
</tr>
</tbody>
</table>

Of these five components, research Methods are very important to achieve the investigation objectives. The primary methods for conducting this ethnographic research, like the subsequent case study, included in-depth interviews, supplemented by documentary evidence such as the University’s Strategic Plan and other documents and minutes of meetings. But it did more than
the case study in that the data sources were supplemented by data collected through participant observation in the research ‘field’, and by informal social contacts with the participants. In this case, the researcher spent one and a half academic years attending all the ISSG meetings and emphasising ‘detailed observational evidence’ (Yin, 1994). The findings from Ethnography I were formally reported to the university’s ISSG and adopted to inform the development of the information strategy.

7.5 The Investigation Process

7.5.1 Reviewing Documents

In order to gain background knowledge, prior to the involvement in the institutional information strategy development, this researcher studied some of the secondary data available from inside and outside the university. The university documents included:

- **Corporate Strategic Plan**
- **Information Technology and Information Systems Contingency Management and Security Strategy**
- **The Student Information Systems**
- **Documents of Information Systems Strategy Group**

The external documents were basically those concerned with information strategies, or the development of an information strategy, including HEFCE’s *Information Systems and Technology Management: Value for Money Study* (1998). For example, by reviewing the document above, the following facts were revealed:

1. Based on responses from UK institutions for a survey conducted by HEFCE in 1997, 24% of institutions had an IT Strategy, 35% were in the process of drafting their IT Strategy, and in total, 74% of institutions had an IS and/or an IT Strategy. However, there was no information on the number of institutions with an
information strategy.

(2) Few of the existing IS or IT strategies linked its use to the institution’s Mission Statement or overall strategic objectives in the Strategic Plan or covered its use throughout the institution.

(3) Whilst some institutions had identified the financial and physical resources of the central IS/IT function, none had a resource model for the institution’s IS/IT provision as a whole.

Having gained some preliminary information on the topic related to information management at the university, the researcher started the investigation process of the ethnography. This is described below.

7.5.2 Participating in Developing the Information Strategy

To gain access to the information strategy process, the researcher went through a series of formal procedures and was permitted by the university’s Information Strategy Steering Group (ISSG) to be on the committee as a special member. Thus she managed to attend all the group meetings – 17 in total. Initially, the researcher was only an observer at such meetings. At all these meetings, she was allowed to be more actively involved and to make her viewpoints heard. Thus this researcher became actively involved not only at the project meetings, but also in the whole process of the university’s information strategy development.

7.5.3 Identifying the Principles of the Information Strategy

At its first ‘get together’ meeting, the ISSG considered the VC’s internal memorandum (John, 1998) as a key document for discussion. It was emphasised that the aim of the group was ‘to evolve into the University’s Information Systems Group’ and the key purpose of doing so was ‘to take forward the further fleshing-out of our IS/IT strategy proper’ (John, 1998). It was also stressed that for developing an information strategy, in the short term there was a need ‘to define the student input-throughput-output data needed for internal and external
purposes' (John, 1998). The committee accepted that one of its highest priorities for action was to improve the quality of the student information that was available to support a whole range of essential operational and strategic activities. The meeting also discussed the requirement to re-assess the university’s short and longer-term information needs and ‘re-engineer’ all the processes which impinged upon the quality of student data.

Operational issues related to these requirements were also discussed and some strategic implications drawn from these issues were raised. These included the need to compare the university’s Information Strategy, IS Strategy, and IT Strategy with each other, and with the Corporate Strategic Plan to ensure that they were ‘aligned’.

As a result of the first few ISSG meetings, the following principles were identified for the university’s Information Strategy:

1. To ensure the accuracy and comprehensiveness of internal management information and information required for external returns and the external quality review.
2. To provide management systems and processes that meet the needs of all the university’s information provision.
3. To establish coordination, authority, ownership and accountability for all university processes.
4. To establish the quality standards required to ensure that information is fit-for-purpose.
5. To provide support to staff, in the form of training and the provision of written guidance on the university’s management systems and processes.
6. To streamline systems and structures to improve efficiency and effectiveness of routine duties.
7. To ensure that events, processes and decisions are audited following implementation.

To help realise these principles, eleven projects were identified as priorities, of which five were existing ones and six were new. The existing
projects included: recruitment review, the short-term SRS solution, the long SRS solution, time-tableing system and computerised personnel system. The new projects included: university archive, information for research, Internet, electronic internal communications, committees/meetings, and project approval.

The ISSG also recognised that 'having an information strategy that would be fully supported by all staff' should generate five main benefits to the university. These were: elimination of unnecessary duplication, removal of bureaucracy, release of time, an informed and knowledgeable community, and recognition and sharing of good practice.

7.5.4 Identifying Information Needs

Based on the seven principles for the information strategy identified at the ISSG meetings (see Section 7.5.3), the committee agreed that the ‘over-riding’ requirement in information strategy was to determine the information needed to better enable decision-making, and the ‘share-ability’ of that information. This further implied a need to look at what information was needed and why it was needed at different levels of the organization. The ISSG suggested that information for both internal and external use be reviewed, and stressed that the information strategy must be linked to the visions and goals of the institution. The ISSG also identified seven key drivers for the university’s information requirements - widening participation, meeting quality assurance standards, academic collaboration between HE and FE, skills development, retention rates, employment rates, and lifelong learning agenda.

7.5.5 Focusing on the Priority Issues

Ideally an information strategy would seek to encompass all of the institution’s information needs and projects that are identified to meet these needs. However, in the real world, this is not possible within the time and resource constraints for information strategy development. At this university, the results of the university’s consultation process (which was supported by this researcher’s
participation in the information needs analysis at the JISC’s workshop - see Chapter 8), persuaded the ISSG that the university's SRS should be a priority organizational issue. Indeed, the consultation process at this university revealed that the SRS was perceived as having flaws, particularly in relation to the requirements for teaching, quality assessments and external returns, while the information needs analysis carried out at the JISC workshop showed that three out of the seven ‘most imperative’ information needs were related to the SRS (see Chapter 8 for details).

Since the SRS was identified as the priority organizational issue for the information strategy development, the data collected from the investigation of the SRS during the action research (see Chapter 6) was found useful for the analysis of these aspects of information needs of this university. In order to overcome the various problems with the SRS, the university decided to update the system. All members of the group were invited to a demonstration of a new SRS, and were also required to review and feed back their comments on the university’s system documentation — *Academic Information Management System: Draft User Requirements*.

With regard to student data requirements and the implementation of the new HEMIS system, it was stressed that the ISSG members should make their best efforts to comment on the *User Specification* so as to enforce necessary possible modifications on the system already purchased. Many constructive comments were made in subsequent meetings, and *ad-hoc* discussions though, as can be seen later in the next section, not all comments were actually taken into consideration owing to the hierarchical power structure of the organization.

### 7.5.6 Additional Enquiries

To gain a broader view on information needs of the university during this research period, in addition to attending the ISSG meetings for in-depth observation of and full participation in the decision-making process of the university’s information strategy development, the researcher also held interviews and *ad-hoc* discussions on the general topic of information needs and information
management with staff and student representatives across the university. All together 43 people (Appendix J) were contacted in these question-and-answer series. Interviews ranged for 10 minutes to an hour with most taking about 25 minutes. Unlike the Action Research conducted in Chapter 6, formal transcripts of these meetings were not usually taken, but notes were assembled from time to time of the typical responses given. Main issues discussed are presented in Appendix K with key findings being highlighted in Section 7.6 below.

These interviews and discussions were mainly used to elicit in a relaxed atmosphere, the ‘real’ issues relating to the university’s information needs and other issues relating to information management. Insights from these discussions were reported back to the ISSG. The researcher thus not only collected primary data for this research, but also had a positive intervention in the research situation.

In this ethnographic research, regarding the design of the new SRS (as opposed to the SRS investigated in the AR in Chapter 6), insight can be drawn from Ulrich’s Critical Systems Heuristics (Ulrich, 1983). It was realised that those involved in the design must be subject to a dialogue with the representatives of those affected (but not directly involved in the design process). It seemed clear that only with agreement among all those involved and affected would valid conclusions about what ought to be done evolve.

The following section is a summary of the main findings from Ethnography I.

7.6 Key Findings and Discussions

This section is split into eight sub-sections, where each summarises a main issue identified within this ethnographic research. Other comments from this ethnographic research are included in Appendix K.
7.6.1 Issues of Coercion and Unbalanced Decisions

At the ISSG meetings, it quite often appeared that the argument of those with more formal authority carried the day. This evidence of coercion, although very politely done, and possibly on occasions subconsciously by all those concerned, was quite important in terms of how decisions were actually made. In some extreme cases, some attendees, normally those who had no or little power, on seeing that they could not influence the decisions of the meeting on the topic under discussion, left the meetings early.

In other cases, when technically-based decisions were required, such as about the purchase of particular information technology facilities, the decision-making ability of the committee got unbalanced in the sense that members not particularly knowledgeable in the topic, but with power, seemed to be able to sway the decision, despite disagreement from technically knowledgeable specialists.

7.6.2 Poor System Management

The following are a few of the examples that illustrate the university’s poor system management.

Regarding the SRS, one senior member of the university management felt very disappointed, saying that “the SRS is extremely badly structured, badly operated and there does not seem to be any clear management of the system. The incorrect input of information is not a major issue. It is the poor management of the system itself that is the problem”. He added that ‘the main purpose of the SRS is a database of students which should keep an accurate record of every student registered, what they have achieved in the past and what they are doing in the present. The system is not even running as a database at the moment. The statistics will not mean anything until the system is managed to run properly. This should be the university’s priority, until then any information taken from the system is unreliable’.
A second senior member (from the University's International Office) supported this, stressing that "it was ridiculous that a new system [the SRS from HEMIS package] was purchased and it was not tested before it went live". She suggested that the system should have been used alongside the existing system for a significant period of time. Instead the system was tested on the first day that international students arrived for enrolment.

A third person (a Deputy Dean of the Business School) was furious when talking about the SRS, saying that 'the way that the university approaches the system's problems is completely wrong as it takes a narrow rather than an holistic point of view of the SRS. It fails to see the way people relate to each other and the cultural problems and barriers that exist'.

A fourth member of staff (a Student Admission Officer) said that the new screens should have been easier to use than the old one, but people had not been trained to complete all the data fields to include all the information from the application forms at the time of enrolment, as opposed to going back at a later date to enter missing data. If the data fields had been completed correctly then the system would have worked better. For example, if a student's email address had been entered it should have been possible to send an email to that student just by clicking on the address. The people who entered the data might have been lazy and only completed the basic information. This would reflect a lack of motivation, and thus be a 'human problem'. Also there were no checks to stop people from leaving out information, which reflected the problem of poor system management.

As no training or support was provided centrally, the faculties normally provided in-house training on an *ad hoc* basis for new staff members. Part of the cause for the missing and incomplete data entry at the enrolment was that too many temporary staff members were used for entering data onto the SRS. Moreover, data entry was anonymous, and the introduction of a signature against entry was thought to be a means of making people accountable.

Here was another example showing the poor system management at this university. A field manager commented that 'it is the role of student advisors to agree with negotiated progression students a list of the modules on which they should be enrolled. The student then takes the module form (MODS1) away to fill
in, but thus introduces the opportunity for the student not to enrol, or to alter the data. It would be useful if instead the student advisors took responsibility for entering the data. Managers, particularly the Faculty Registrars, should also possess an understanding of how the system operates, and be empowered to rectify such an abnormal working system.

It was also discussed that there was a duplication of committees within the university which appeared to be looking at similar, if not the same, issues. In addition, the university was also found to be using different systems for different functions, for instance, EMIS for admissions, and HEMIS for the SRS, which was a major problem as this resulted in, for example, a repetitive process of data entry.

### 7.6.3 Inconsistent Information Provision

Inconsistency of information provision appeared to be a serious problem within the university. Many examples were given regarding this. A senior management staff illustrated this, saying that ‘The HESA return should be used to provide information on the cohorts of previous years’. However, at this university, such information was obtained from the SRS which was seen as having problems of various sorts (see Section 6.7.3). As a result, the information used was not accurate, and inconsistent with the information that was to be sent to HESA which should be obtained from a central source. In addition, the annual Department Review also used figures that were inconsistent with the HESA return. The reason for this was that it was not possible for a member of staff to print a HESA extraction from the database. Another example of inconsistent information was the university’s marking scheme. The change to the marking scheme to a 16-point scale from percentages was not introduced gradually with the level-one cohort first and then following through into subsequent years as this cohort progressed. Transcripts were confusing as there was a mixture of percentages, 16-point scale, as well as grades. However, nobody had been empowered to look into, and solve the problem.
7.6.4 Lack of Information Ownership and Priority

At this university there appeared to be different levels of user access to the SRS, but it was not clear who determined the level of access and what the levels were. There was no overall management or ownership of the system, and users were unclear where to go for assistance. The head of a department said, “different pieces of information are required by different users at different times but somebody needs to be co-ordinating the requests. The situation is that ‘he who shouts the loudest gets the result’. For the faculties, Subject Review is the priority, but who is to say that Subject Review is more important than producing accurate fee information to students”. For the Subject Review document of an academic year, one Faculty Registrar tried to compare the faculty’s ethnicity and gender base with the university rates. However, no one knew where this information could be obtained, not even Student Services. ‘Profiles of students on modules, particularly race, age and gender details, could have informed teaching.’ Someone added that the annual monitoring process had become a meaningless exercise because of the lack of availability of statistical information.

7.6.5 Ignorance of User’s Information Needs

Ignorance of the users’ needs for information also turned out to be a key explanation of many complaints. Examples are:

(1) A staff member complained, “Things are the wrong way round when the University’s Centre Administration designs forms for the academics to use. The users of the information are not the ones that specify the information that is needed and the format of the form. There should be more consultation to provide the Centre with the views of the users.”

(2) Computer-based assessment results were not provided in a format that suited the course team’s requirements. A senior lecturer was dissatisfied with the university’s ignorance of the user information requirements, saying that ‘the course team are provided with an Excel file but this lists the grades in percentages
which then needs to be converted into the university’s 16-point grading in the SRS. In addition students are listed by ID number and the first four letters of their name which requires extra effort on the part of course team to produce an alphabetical listing of students by surname.’

(3) The purchase of the off-the-shelf package (HEMIS) failed to meet users’ needs of SRS.

7.6.6 Inadequate Working Systems

Within the university, inadequate working systems in information management had wasted considerable effort. Examples included:

(1) To get information about their students, a lecturer from the Business School had to go through the faculty administrator. Many staff needed to have access to the SRS to facilitate their work, but they had not been given the priority. Some lecturers in some faculties had read-only access, but not in the Business School. So it was not clear whether it was a Business School decision to deny lecturers’ access or whether the staff had simply not been informed that access was available. Nobody coordinated these requests to say whether it could be provided, and what level of access was allowed. There should be some flexibility to the key staff who need to access the SRS for doing a better job. Some staff said that ‘Technology should be made to serve the human requirements not the other way round’.

(2) The failings in the ‘human systems’ that ran parallel to the SRS were not recognised. A senior administrator gave the following example. “The Student Administration (SA) set the fee for a module against a particular semester. When faculties change the semester and inform Quality Assurance, a form is completed and then sent to the Modular Office (MO) to amend the module details and then on to the SA to change the fee information. This information often remains with the MO for quite a while and arrives with SA too late. This results in invoices being issued that are incorrect and faculties receiving incorrect modular income.” Inadequate systems had been ‘worked around’ too often.
(3) An administrator from the Business School complained that the courses were re-coded by QA without any consultation. And as a result codes for the same course were duplicated. For instance, one report used two different codes and two different programme titles for the same course at different levels - [1] PAL-HND! Public Administration (Legal Studies); [b] PAL-HND Public Administration (Legal Pathway). This caused problems when printing examination board reports. There had been no consultation and no formal notification that codes had been changed.

7.6.7 Poor Communication and Information Sharing

Communication and information sharing were felt to be problematic. There were many local systems within the university that worked in isolation and did not feed into the central system, and the Centre Administration did not have the basic sets of accurate information. There was a growing view that all faculties should keep their own statistical information about their students, as it was not possible to obtain reliable statistics from the central system. So effort was wasted for creating duplication of the same information at various levels or holding pieces of information about the same group of students. A student may tell the Alumni Department their new address and employment details, faculties may receive up-to-date contact information from students for graduation, and lecturers have information about graduate employment, but the majority of this information does not get on to the central system.

Other examples to show the problem of communication and information sharing included:

(1) An auto-enrol facility was introduced for core modules, but this was not communicated to the staff enrolling students on the modules, the faculty staff who were advising students on module choice, or the students who were completing their module forms (MODS1). A significant amount of effort could have been saved if this had been handled properly.

(2) A Help Desk for queries was accessible on the university’s web page, but the majority of users did not know about it.
(3) It was not known that it was possible to obtain registers for seminar groups from the SRS.

(4) When a system problem occurred, it was often a guessing game about where to go for assistance - whether it was Academic Computing Services (ACS) or Networks.

7.6.8 Poor Implementation Plans

The university's information strategy document had planned, in general terms, for implementing some of the projects designed for achieving the objectives set out in its information strategy. Specifically, it listed such topics as: the short-term SRS solution; the long-term SRS solution; a computerised personnel information system, and the timetabling system.

However, many of these specific tasks were not acted upon. For example, regarding the short-term SRS solution, implementation of a new system was postponed, and so a significant number of changes were required to maintain the existing system. However, little appropriate action was taken to fix the main problems - data quality, sustainability, management reporting, and customer dissatisfaction - that urgently needed addressing at that time. This was partly due to the lack of an overall manager of the SRS within the university and thus lack of liaison between system users and system administrators. Moreover, the ISSG stressed that to deliver the long-term SRS solution, the university needed to create a project team which should work in parallel to the developmental and maintenance work of the ACS Department. However it was not specified when this team would come into being. Overall, in terms of the SRS, monitoring of implementation of the system was needed, as had been set out in the information strategy document, but had not been implemented. As someone put it: “The institution says one thing but does another”.

Another problem that hindered the implementation of the information strategy was the constant stream of external issues, such as RAE (Research Assessment Exercise) and QAA (Quality Assurance Assessment), which prevented the implementation project managers/staff from carrying the planned
projects forward, as they were distracted by other projects which were thought to be more important and thus required more immediate attention.

In summary, the above sections have discussed a number of findings related to critical systems thinking (CST) issues that emerged from this ethnographic research. These included coercion, unbalanced decision-making, poor system management, lack of information ownership, ignorance of the user information needs, poor communication, poor information sharing, and poor implementation planning. Much of the information collected in Ethnography I supported the information already gathered in the Action Research, and led to the general reflections given next.

7.7 Critical Reflections from Ethnography I

7.7.1 Reflections on the Evaluative Framework Drawn from Ethnography I

Participating in the ISSG meetings held to discuss the development of an information strategy for the university was very instructive. It was found that in common with the development of such strategies at most other HEIs, an information strategy at this university was considered to be a ‘Good Thing’, with the importance of information being recognised and hence good management of that information being to the university’s benefits.

In the information strategy evaluative framework of Figure 4.7, the elements listed under ‘control structures’ (preparing, planning, developing, implementing, monitoring, and reviewing) have been drawn largely from JISC’s documented empirical experience. In particular, Table 4.6 in Chapter 4 gives detailed aspects that can be considered within the overall development and implementation process of an information strategy. Based on the ‘control structures’ of the evaluative framework, the following reflections have been drawn:
A. 'Preparing' the Information Strategy

In terms of preparing the information strategy, the researcher’s experience in attending the ISSG meetings confirmed that it was difficult for the university to form a strategic view on the information strategy development from the outset. Clearly there was much uncertainty over what an information strategy is, what it should comprise and how it might be achieved.

It was also identified that a degree of coercion and unbalanced decision-making was evident at the ISSG meetings. For example, while some people insisted on developing the strategy in a prescriptive format, using a highly bureaucratic ‘hard’ approach, others suggested carrying out the process as a participative exercise, using a ‘soft’ approach, and employing the output to help the formulation of the strategy. However these two approaches are very different in nature, and the actual process undertaken was very much ‘top-down’ and directed, despite attempts by some of the members at the ISSG meetings to introduce critical systems thinking ideas. The latter might have allowed a cohesive and integrated approach to be used embracing both ‘hard’ and ‘soft’ perspectives. Of course management has to manage, but the failure of so many information systems, including the SRS directly to hand, ought to have suggested the need for a more inclusive approach to implementing something as radical and far-reaching as a university-wide information strategy (also see Sections 7.6.1 and 7.6.2).

Regarding the issues of coercion and unbalanced decision-making referred to above, Section 2.3 in Chapter 2 gives some of the recognised social theories that address these issues. These theories do not, of course, lead directly to a ‘technical fix’ to the issues, but do provide insights to help understand human behaviour and attitudes in real situations, and allow to be reflected upon. Moreover, the various methodologies also covered in Chapter 2 (see Sections 2.4 and 2.5), give more prescriptive approaches for how such situations might be tackled.
B. ‘Planning’ the Information Strategy

In terms of planning the information strategy, an important aspect is the issues of dissemination and access of information. Information is of little use without access. Regarding this, the ethnography at this university showed that there was a lot of room for improvement. For example, the SRS, one of the key information systems at the university, was said to have been ‘badly structured and operated’, and what had made it even worse was that such a system was purchased and went live without testing. There was no appropriate thinking about the purpose of the system and no appropriate plan for the system at the outset (also see Sections 7.6.2, 7.6.5 and 7.6.6).

A pilot HEI document said ‘a university should make accurate, appropriate and comprehensive information available to internal and external users, including prospective students, current and potential research partners, and local, regional, national and international communities’. It is suggested that information held in any part of the university should, where appropriate, be planned to be ready for sharing and easily accessible to those who need it, subject to relevant legal constraints and the safeguarding of the university’s interests.

C. ‘Developing’ an Information Strategy

To ‘develop’ an effective information strategy, one of the most important things to do is to define the scope of information. Key to this is to understand the information needs of the university and its members, and the way information flows within the organization. However, in the case of this university, partly because of the other responsibilities of the Information Strategy Co-ordinator, the time allocated to the formulation of the information strategy itself was limited. As the main part of the university’s information strategy process, the SRS was the only system investigated, and most people involved in the investigation process were senior management staff, mostly administrators. There were no student representatives, and not enough academic representatives and other users of the SRS involved in the process of generating the information strategy. The focus
appeared to be too narrow to generate a full picture of the information needs of the university. In addition, inadequate attention was paid to issues of communication and information sharing across the university (also see Sections 7.6.5 and 7.6.6).

D. ‘Implementing’ the Information Strategy

When discussing the ‘implementing’ element of the framework, the members at the ISSG meetings disagreed about the topic ‘responsibilities towards information provision’. However, empirical evidence shows that a key requirement under ‘responsibilities’ is to motivate the users and help them understand the importance of information. As a document from a JISC’s pilot site says:

‘All users should be encouraged to form the good practice of generating information that is of value to others, and to be accountable for the generation, acquisition, maintenance and provision of cost-effective information. They should also be conscious of the costs associated with a lack of information, unnecessary duplication of information, inaccuracy of information and incompatibilities among systems.’

In this respect, this university had room for improvement. However, this is easier said than done. To help achieve this, critical analysis can be conducted of the attitudes and behaviour of information users, and solutions or suggestions provided to problems needing attention. (Also see Sections 7.6.3 to 7.6.8).

A separate point related to ‘implementing’ the information strategy was that it was found that a large knowledge base about the SRS was held in the heads of certain key staff members of around the university. If the university loses these staff, the knowledge of what the SRS can do will also be lost. Knowledge was taken for granted by these people. The university ought to think about doing something to keep such a ‘knowledge base’.
E. ‘Monitoring’ and ‘Reviewing’ the Information Strategy

In terms of monitoring and reviewing the information strategy once it is place, one important aspect is the issue of the ownership of information. The strategy is intended to help the university increase the accountability of responsibility and make it clearer who generates each piece of information, who is responsible for maintaining and updating it, who has the right to alter it and who is permitted to access it. In addition, there should also be a list of contact names for specific problems with the system, and people needed to be informed of this reporting system. As was suggested, key information such as that required for Subject Review, should reside in a statistical office based in ACS, and be managed by a statistician whose responsibility is to provide basic data sets and an information service. The person empowered should provide users with regular updates. In general the aim of the university should be that all information held should be acquired once only, and the definitive version should be stored and kept up-to-date by its owner(s) at only one location so as to keep information accurate and consistent, and appropriate to the standards required by users. Clear mechanisms ought to be established for monitoring the quality of information provided centrally, identifying and correcting inadequacies in information and processes and facilitating feedback from users to providers (also see Section 7.6.4).

Many of the issues identified above within Ethnography I mirrored those raised in the AR in Chapter 6. However in this ethnography they were raised at a higher level (within ISSG), and were set against discussion about formulating an information strategy for the university. Overall, in terms of the wider CST perspectives, Ethnography I highlighted the following:

(1) Issues of hierarchy, in the way that technical and other decision-making took place within ISSG meetings.

(2) The fact that decisions to do with formulating an information strategy for the university were being taken by a high-level committee, with little attempt to allow an emergent strategy to be developed, or for human-centred approaches to be embedded into the strategy formulation process.
F. Analysis of the ‘External Environment’ and ‘Competitive Advantage’

HEIs frequently have to adapt to external pressures, including the need to respond to various rapidly changing factors in the external environment. JISC (1998b) stated that ‘... external environments are important’. So a critical analysis of the possible impact of this external factor may lead to a strategy being adopted more resistant to such outside pressures.

The ISSG meetings at the university did not have explicit discussions on the external environment and competitive advantage; and the information strategy document did not include these either. However, to develop and implement an effective information strategy for the university, important factors related to both ‘external environment’ and ‘competitive advantage’ cannot be ignored, since they could have significant impacts on the future of the university. Factors that might be considered include increasing demand from students; increased vocational related courses and decreased traditional courses; widening range of module choices; the increasing global competition for students and for funding; provision of e-learning; less strict criteria for student recruitment from other better-known HEIs; changes in governmental policies; and so on. It will help the formulation of a more effective information strategy if the likely impacts of such factors are considered rationally.

In analysing the External Environment, many models could be used, including the PEST model, Campbell et al. (1999) ‘skin of an onion’ view (Figure 3.9); McFarlan’s (1984) ‘strategic grid’ (Figure 3.2); and Johnson and Scholes’ (1993) matching of an organizations’ capabilities to the environment (see Chapter 2). All these have been widely used for analysing the complexity of an organization’s external environment.

Chapter 2 also discussed several frameworks developed by Porter (1980, 1990) and Earl’s (1989) business strategy frameworks. They both can be adapted by an HEI to provide an overall method for analysing and managing its competitive position in respect of information. Chapter 2 also listed the primary
activities of an HEI to gain competitive advantage against Porter's (1990) 'value chain'

7.7.2 Summary of Reflections

Figure 7.1 shows diagrammatically how the above critical reflections link with the evaluative framework of Chapter 4 (Figure 4.7). Here the framework elements within the categories of the 'Control Structures' (Preparing, Planning, Developing, Implementing, Monitoring and Reviewing) and the 'External Environment' (External Environment and Competitive Advantage) are highlighted to show that these have been examined in some depth. As can also be seen in this figure, in the box on the top of the diagram, key Critical Systems Thinking ideas and the main methods or methodologies employed in the investigation of the information strategy process of the university are highlighted. These include four methods of enquiry (observation, interview, discussion and participative research) that are based on the Kantian notion of aiming to discover people's perceptions of reality. The Habermasian perspective is encompassed by the types of knowledge (interest) that those enquiries sought to uncover: simple technical interest, 'practical' (human-interaction) interest, and issues to do with emancipation (e.g. the employee's self-potential), power and coercion. The Foucault-ian view was introduced by seeking to understand if those who hold the power also control the truth.

The overall notion embedded in Figure 7.1 is that those responsible for developing and implementing an information strategy at an HEI would do well to look at the organization (its information needs, structure, culture, resources, etc.), and then select enquiry and implementation methodologies most appropriate to the strategy's development and implementation phases. Overall, the aim of this emphasis is to make the CST process more explicit in the evaluation of information strategies.
Figure 7.1 Aspects of the Evaluative Framework Addressed by Ethnography I
(This figure highlights key areas informed by the ethnographic research and methodologies employed)
7.8 The Ethnography Perspective

One of the most valuable aspects of this ethnographic research has been its depth. Being 'there' for an extended period of time (18 months) observing the whole process of an institutional information strategy at the ISSG meetings, the researcher saw what the members at the meetings were doing, and listened to what they said they were doing. When this ethnographic research was drawing to an end, the researcher felt she had gained a rather better (or 'in-depth') understanding of the different roles of the members of the university, the university itself and the broader context within which these people worked. By being immersed in 'where the action is', the researcher had developed an intimate familiarity with the dilemmas, frustrations, routines, relationships and risks that are part of daily life. In addition, it was found that knowledge of what happened in the field had provided vital information to challenge the taken-for-granted assumptions, and that the information provided by the ethnography had provided a deeper understanding of the problem domain.

However, it proved that this ethnographic research had taken a longer time to complete than had been planned for – the longest among the four pieces of research conducted for this study. In addition, it has also taken a long time to analyse the data collected and write it up. Nevertheless, although very time-consuming, this ethnographic research turned out to be a very 'productive' research method, as described earlier, it had some substantial research findings which could not have been obtained otherwise. The results, therefore, justified the efforts made in this ethnographical research.

7.9 Summary and Conclusions

To sum up the findings from this piece of empirical research, an information strategy at this university was considered to be a 'Good Thing' but
there was uncertainty over what an information strategy is, what it should consist of, and how it might be formulated. For instance, some of the people involved in the strategy development insisted on developing the strategy in a prescribed format; others suggested carrying out this process as a participative exercise. In the event, the process undertaken at the university was very much 'top-down' and directed. This was despite attempts to introduce Critical Systems Thinking ideas which might have allowed a more holistic methodology to embrace various perspectives and different approaches.

As was implied in the point above, there was evidence (although fairly mild) of coercion and unbalanced decision-making within the university's ISSG meetings. The information strategy evaluative framework of Chapter 4 (Figure 4.7) draws attention to some of the social theories that address these issues via Section 2.3. These theories do not lead necessarily to direct solutions, but do provide insights into human behaviour and attitudes to allow the situations to be reflected upon and addressed from a well-focussed viewpoint. For example, the process could have included the integration of the diversity of perceptions of the participants with regard to the given issues, built consensus and joint ownership of the process and product, and created a collaborative action plan to accomplish the participant’s goals.

In terms of implementing the information strategy, the evaluation framework gives detailed aspects to be considered within the implementation process. These were discussed in Section 7.7 above under the ‘Control Structures’ headings of preparing, planning, developing, implementing and monitoring and reviewing; and under the 'external environment' and 'competitive advantage' headings. These critical reflection sections described some of the main insights gained from this piece of empirical research.

Within this research it was noted that a key requirement of an information strategy is for the information users to understand the importance of information, including an awareness of the costs associated with lack of information, unnecessary duplication, inaccuracy, and incompatibilities among systems. In this context, the view was expressed at one of the ISSG meetings that 'there should be less staff [on the SRS] who are paid more, but who receive adequate training'. It
was certainly clear that the moves towards a strategy so far had not properly addressed this issue of getting a sufficiently widespread acceptance of this concept of the importance of information to the effective functioning of the institution.

With respect to the scope of formulating the information strategy, the people included in the information strategy process were mostly senior management staff and administrators. There were no student representatives and not enough academic representatives or other systems users. The focus appeared to be too narrow to generate a full picture of the University's information needs.

Information is of little use without access. A pilot HEI document had said 'a university should make accurate, appropriate and comprehensive information available to internal and external users, including prospective students, current and potential research partners, and local, regional, national and international communities. Thus, information held in any part of the university should, where appropriate, be shared and easily accessible to those who need it, subject to relevant legal constraints and the safeguarding of the university's interests'. It was recognised at the university that this should be a key aim of the information strategy as developed.

As a final observation from Ethnography I, it was recognised that to move away from the 'blame culture' of the SRS and related systems, the university needed to make it clear who generates each piece of information, who is responsible for maintaining and updating it, who has the right to alter it and who is permitted access. In addition, there should be a list of contact names for specific problems with the systems, and all users needed to be informed of this reporting system.

A separate but inter-linking piece of empirical research within this thesis was this researcher's participant observation at a series of JISC workshops and conferences on information strategy. This is discussed in the next Chapter.
CHAPTER 8

ETHNOGRAPHY II – PARTICIPANT OBSERVATION
AT WORKSHOPS AND CONFERENCES ON
INFORMATION STRATEGY
CHAPTER 8
ETHNOGRAPHY II – PARTICIPANT OBSERVATION AT
WORKSHOPS AND CONFERENCES ON INFORMATION
STRATEGY

8.1 Introduction

This chapter describes the investigation process and key issues identified from the third piece of empirical research for this thesis - Ethnography II. This was concerned with the researcher’s participant observation at workshops and conferences on information strategy development at UK HEIs organised by JISC. The main objectives of the ethnographic research were:

(1) To expand the empirical research already taken (see Chapters 6 and 7) to include other UK HEIs beyond the institution where the first two pieces of empirical research had been conducted;

(2) To find out what these other HEIs were doing in terms of developing and implementing their information strategies, so as to widen the researcher’s understanding of the information strategy development and implementation processes by including perspectives from these HEIs;

(3) To triangulate the data from this piece of ethnographic research with those collected from the Action Research (Chapter 6) and Ethnography I (Chapter 7), aiming at validating the research findings and adding insights to the information strategy evaluative framework of Chapter 4.

The main activities of the researcher in this ethnographic research were as follows:

(1) To collect documents on related topics for empirical literature review;
(2) To be fully involved in all the workshop activities, i.e. to be immersed in the research ‘field’ for an extended period of time, which is the key characteristic of ethnographic research;

(3) To observe the behaviour of members at the workshops and conferences, and listen to and engage in conversations;

(4) To take the opportunity these meetings provided to set up links and to interview a selection of participants for their particular views on issues relating to information strategy development at their institutions.

8.2 Background of Ethnography II

As mentioned above, Ethnography II of this thesis was carried out primarily by this researcher attending a series of workshops and conferences organised by JISC to facilitate the process of information strategy development at HEIs. A background to information strategy development at UK HEIs, and details of how JISC had helped HEIs with such a development, have been given in Chapter 3.

To aid the HEIs that were working on developing an information strategy for their institutions, and to encourage these institutions to learn from each other’s experience, JISC arranged a series of one-day workshops and conferences in London spread throughout 1999 and 2000 to which universities were encouraged to send their representatives. The researcher attended these workshops and three conferences, partly to represent the University of Luton (which had by then decided to develop its institutional information strategy), and partly for the purpose of conducting ethnographic research for this thesis. The sessions of the workshops and the conferences which the researcher attended are listed in Table 8.1.
Table 8.1 JISC's Information Strategy Workshops and Conferences Attended

<table>
<thead>
<tr>
<th>Research Activity</th>
<th>Theme</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Workshop 1</td>
<td>Prioritising information needs</td>
<td>22/03/1999</td>
</tr>
<tr>
<td>Workshop 2</td>
<td>Drafting the information strategy framework document</td>
<td>28/06/1999</td>
</tr>
<tr>
<td>Workshop 3</td>
<td>Getting started</td>
<td>13/10/1999</td>
</tr>
<tr>
<td>Workshop 4</td>
<td>Information needs</td>
<td>24/11/1999</td>
</tr>
<tr>
<td>Workshop 5</td>
<td>Planning the implementation</td>
<td>16/02/2000</td>
</tr>
<tr>
<td>Workshop 6</td>
<td>Roles and responsibilities and drafting the information strategy framework document</td>
<td>15/03/2000</td>
</tr>
<tr>
<td>Workshop 7</td>
<td>Monitoring and review</td>
<td>10/05/2000</td>
</tr>
<tr>
<td>Conference 1</td>
<td>Information Strategy Conference - 'Learning from Business'</td>
<td>20/05/1999</td>
</tr>
<tr>
<td>Conference 2</td>
<td>Information Strategy Conference - 'Focus on access and security'</td>
<td>10/02/2000</td>
</tr>
<tr>
<td>Conference 3</td>
<td>Information Strategy Conference - 'Focus on funding'</td>
<td>7/12/2000</td>
</tr>
</tbody>
</table>

8.3 Attendance at Workshops and Issues Discussed

8.3.1 The First Workshop: Information Needs Prioritisation

At the first of these workshops "Prioritising information needs", all participants were encouraged to list the key information needs of their universities, and as a result 33 (later augmented to 36) key information needs were identified. These were broadly divided into two categories: the needs that benefit students, and the needs that benefit management, administrative, academic or other staff. Details of these information needs are listed in Table 8.2, which illustrates how extensive such a list can be. These information needs were then analysed and the outcome of this analysis is shown in Table 8.3.

Having determined the basic information needs, the subsequent task was to prioritise these. Experience from the JISC workshops and pilot sites showed that information needs analysis generally results in too many information needs - usually in the form of 'wish lists'. Since it is not possible to meet all the needs within given resource constraints, there is a need to prioritise information needs. This should be done step by step, for example, by examining areas - faculties,
groups, for their specific information needs; and by relating needs to the university’s mission, or otherwise determining what is important for the institution.

*Table 8.2 Information Needs Identified*

<table>
<thead>
<tr>
<th>A. The needs that benefit students</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Module options available.</td>
</tr>
<tr>
<td>(2) Rooms and resources available.</td>
</tr>
<tr>
<td>(3) Timetables</td>
</tr>
<tr>
<td>(4) Staff specialisms.</td>
</tr>
<tr>
<td>(5) How to contact tutors.</td>
</tr>
<tr>
<td>(6) Procedure for the dissemination of examination results.</td>
</tr>
<tr>
<td>(7) Where to find out about student loans.</td>
</tr>
<tr>
<td>(8) “Notes for the lecture I missed last week.”</td>
</tr>
<tr>
<td>(9) How to access a specialist resource.</td>
</tr>
<tr>
<td>(10) Information skills of students.</td>
</tr>
<tr>
<td>(11) Previous exposure of students to a given subject.</td>
</tr>
<tr>
<td>(12) Module assessment criteria.</td>
</tr>
<tr>
<td>(13) Reading lists.</td>
</tr>
<tr>
<td>(14) Funding available for research.</td>
</tr>
<tr>
<td>(15) Who to go to for help.</td>
</tr>
<tr>
<td>(16) Information about students’ special needs.</td>
</tr>
<tr>
<td>(17) To access the current version of teaching material.</td>
</tr>
<tr>
<td>(18) To know in advance if a session is cancelled.</td>
</tr>
<tr>
<td>(19) Benchmarking data.</td>
</tr>
<tr>
<td>(20) Accessing recommended texts from the library.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B. The needs that benefit management, administrative, academic or other staff</th>
</tr>
</thead>
<tbody>
<tr>
<td>(21) To know current version of teaching material.</td>
</tr>
<tr>
<td>(22) What our competitors are planning.</td>
</tr>
<tr>
<td>(23) Rooms and resources available.</td>
</tr>
<tr>
<td>(24) Timetables.</td>
</tr>
<tr>
<td>(25) The costs of using buildings (heating, lighting, cleaning etc.).</td>
</tr>
<tr>
<td>(26) Staff teaching loads.</td>
</tr>
<tr>
<td>(27) Space utilisation.</td>
</tr>
<tr>
<td>(28) The views and plans of management.</td>
</tr>
<tr>
<td>(29) The views of staff.</td>
</tr>
<tr>
<td>(30) Information of students on modules.</td>
</tr>
<tr>
<td>(31) Staff availability for meetings.</td>
</tr>
<tr>
<td>(32) How to contact students.</td>
</tr>
<tr>
<td>(33) How much is there left to spend this year.</td>
</tr>
<tr>
<td>(34) Contacts with employers.</td>
</tr>
<tr>
<td>(35) Contact with colleagues on research project in the UK and overseas.</td>
</tr>
<tr>
<td>(36) Exchanging information with colleagues on different sites.</td>
</tr>
</tbody>
</table>
### Table 8.3 Information Needs Analysis

<table>
<thead>
<tr>
<th>Info Needs</th>
<th>Who will benefit?</th>
<th>Means of achieving the benefit</th>
<th>Imperative</th>
<th>Important</th>
<th>Incidental</th>
<th>Quick Win</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What our competitors are planning?</td>
<td>Institution</td>
<td>The web, other publications</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Modules options available</td>
<td>Students</td>
<td>Information pack, Student Handbook, the web</td>
<td>√</td>
<td></td>
<td></td>
<td>√</td>
</tr>
<tr>
<td>3. Students on modules</td>
<td>Administrators, tutors</td>
<td>The student records system</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Rooms and resources available</td>
<td>Students, institution</td>
<td>Booking systems, timetabling</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Staff availability for meetings</td>
<td>Institution</td>
<td>E-mailing, internal post</td>
<td></td>
<td></td>
<td>√</td>
<td></td>
</tr>
<tr>
<td>6. Staff specialisms</td>
<td>Students, staff, institution</td>
<td>Handbook, data base, web</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. How to contact tutors</td>
<td>Students</td>
<td>Students information pack</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. How to contact students</td>
<td>Tutors</td>
<td>Students records system</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Procedure for the dissemination of examination results</td>
<td>Students</td>
<td>Posters, letters, the Intranet</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. How much I have left to spend this year</td>
<td>Section/dept. directors</td>
<td>Budgeting, records of spending</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Where to find out about student loans</td>
<td>Students</td>
<td>Information pack, the Web</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. “Notes for the lecture I missed last week.”</td>
<td>Students</td>
<td>The Intranet, handouts</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. The costs of using buildings (heating, lighting, cleaning etc.)</td>
<td>Institution</td>
<td>Monitoring</td>
<td>√</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. How to make the resources I know are available in my specialism available to my students</td>
<td>Students</td>
<td>The Web (Intranet), booklet, notices board</td>
<td>√</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. My students' skill in getting information</td>
<td>Students, tutors</td>
<td>Teaching, training, facility provision</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. The previous exposure to my subject of my students</td>
<td>Students, tutors</td>
<td>Introduction</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. Staff teaching loads</td>
<td>Institution</td>
<td>E-mailing, internal post</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18. Space utilisation</td>
<td>Institution</td>
<td>Monitoring</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19. Contacts with employers</td>
<td>Staff</td>
<td>Visiting, phoning, e-mailing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20. Module assessment criteria</td>
<td>Students</td>
<td>The Intranet, e-mailing, notice board, staff and student handbooks</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

240
<table>
<thead>
<tr>
<th>Info</th>
<th>Needs Number</th>
<th>Who will benefit?</th>
<th>Means of achieving the benefit</th>
<th>Imperative</th>
<th>Important</th>
<th>Incidental</th>
<th>Quick Win</th>
</tr>
</thead>
<tbody>
<tr>
<td>21. Reading lists</td>
<td>Students</td>
<td>Handout sheet, the Intranet</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22. Funding available for research</td>
<td>Students, academic staff</td>
<td>E-mail, publishing on the Web</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23. The views and plans of management</td>
<td>Institution</td>
<td>Communication, meeting</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24. The views of staff</td>
<td>Institution, students, staff</td>
<td>Meetings, seminars, e-chatting</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25. Who to go to for help (for Students)</td>
<td>Students</td>
<td>Information pack, the Intranet</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26. Information about students' special needs</td>
<td>Students</td>
<td>Students records</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27. To know current version of documents</td>
<td>Students, staff</td>
<td>Notice board, the Web</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28. To know in advance if a session is cancelled</td>
<td>Students</td>
<td>Notice board, the Intranet</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29. Bench-marking data</td>
<td>Staff/students</td>
<td>Data base, hard copies, the web</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30. Need to be able to access recommended texts from the library</td>
<td>Student, staff</td>
<td>Make the texts available in the university's library and bookshop</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31. Contact with colleagues on research project overseas</td>
<td>Staff</td>
<td>Letter, e-mail, Telephone</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32. Procedure for the dissemination of examination results</td>
<td>Student/staff</td>
<td>Communication – letter, intranet</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>33. Need to exchange views with colleagues on different sites</td>
<td>Students/staff</td>
<td>Meetings, visiting, e-mailing, social activities</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
One thing that became clear from this first workshop was that the method for prioritising information needs is an important issue to consider. To prioritise the ‘imperative’ and ‘important’ issues of information needs listed in Table 8.2, four groups of participants, representing 17 UK universities at this workshop, were asked to look at the information needs. Then by applying different methods for prioritisation, for example, the methods listed in Appendix E, they agreed the following seven key information needs area as ‘imperative’ in relation to the mission statements of their respective universities:

1. Centralized timetables
2. Realigning incompatible systems
3. Examination issues
4. Module handbook for module co-ordinators and students
5. Access to the internet from students’ residences
6. Links to partners of other institutions
7. Access to students records

Then with the help of the representatives from four other UK universities at the same workshop, the method – ‘Paired Comparisons and Vote Chart’ was chosen for prioritising the seven ‘imperative' information needs. The technique is useful where a number of options have to be prioritised by a group of people and a common decision arrived at. It required individuals to compare each option with all of the others in turn and select one of the two in each case. The number of times each option was selected was then counted by each member and aggregated with all the others to arrive at an overall ranking. It has the advantage that it required serious consideration of all the options, including those that were less immediately attractive. The results are shown in the Table 8.4:

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1 Norwich School of Art and Design, Royal Holloway, University of London, University of Wolverhampton, as well as University of Luton
Table 8.4 Paired Comparisons and Vote Chart

<table>
<thead>
<tr>
<th>Information needs</th>
<th>Position Voted</th>
<th>Total Score</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Centralized timetables</td>
<td>3 6 2 1</td>
<td>12</td>
<td>2</td>
</tr>
<tr>
<td>2 Realigning incompatible systems</td>
<td>1 1 4 7</td>
<td>13</td>
<td>3</td>
</tr>
<tr>
<td>3 Examination issues</td>
<td>4 4 6 2</td>
<td>16</td>
<td>5</td>
</tr>
<tr>
<td>4 Module handbook for module co-ordinators and students</td>
<td>7 5 1 2</td>
<td>15</td>
<td>4</td>
</tr>
<tr>
<td>5 Access to students' records</td>
<td>2 2 3 2</td>
<td>9</td>
<td>1</td>
</tr>
<tr>
<td>6 Links to partners of other institutions</td>
<td>6 7 5 5</td>
<td>23</td>
<td>7</td>
</tr>
<tr>
<td>7 Access the Internet from students residences</td>
<td>5 3 7 6</td>
<td>21</td>
<td>6</td>
</tr>
</tbody>
</table>

As shown in the table above, the prioritisation of the information needs resulted in the following order:

1. Access to students’ records
2. Centralized timetables
3. Realigning incompatible systems
4. Module handbook for module co-ordinators and students
5. Examination issues
6. Ability to access the Internet from students’ residences
7. Links to partners of other institutions

This researcher was pleased to have participated in this workshop, for the lessons learned and the information collected from the workshop informed the information needs analysis and prioritisation at the university where the researcher participated and facilitated in the process for its information strategy development.

8.3.2 The Later Workshops: Information Strategy Development

A second workshop (Workshop 2 in Table 8.1 – page 237) discussed the drafting of an information strategy framework document. This topic was also addressed in a later workshop (Workshop 6 in Table 8.1).

The subsequent sequence of five workshops (Workshops 3 - 7 in Table 8.1), also led by the Information Strategy Co-ordinator, broadly followed the
stages of the JISC's *Guidelines* (1998b). A presentation was given at each workshop followed by informal discussions and case studies from the representatives’ universities.

The first of these five subsequent workshops (Workshop 3 in Table 8.1) gave an overview of the *Guidelines* and took participants through the first stage of an information strategy development as stated in the *Guidelines* – ‘Getting started’. At this workshop a series of group exercises were designed to set the participants thinking about their own institution's mission, challenges and opportunities and the resulting information needs.

The second workshop (Workshop 4 in Table 8.1) dealt with the second stage of the *Guidelines* – ‘Information needs’, which was found to be the bulk of the development work. At this workshop participants were provided with an opportunity to experience the three methodologies for defining information needs outlined in the *Guidelines* - functional analysis, life-cycle analysis, and information initiatives (see Appendix E). Participants were encouraged to use these various methodologies to consider areas for investigation within their own institutions. The experiences of two pilot sites - the University of Glamorgan and Queen’s University of Belfast, were presented at the workshop to provide the participants with first-hand accounts.

At the third workshop (Workshop 5 in Table 8.1) – ‘Planning the implementation’, participants were required to review the progress for information strategy development at their institution and to make plans to reach their goals. Much of the discussion at the workshop involved some form of prioritisation. Participants had some experience of using different methodologies, including those illustrated in Tables 8.3 and 8.4, to aid the decision-making process in agreeing information strategy priorities.

As many institutions found the structures put in place in the *Guidelines* had not been as effective as expected, they stressed it necessary to amend the structures to enable them to better implement and monitor the strategy. Therefore, much of the discussion at the fourth workshop (Workshop 6 in Table 8.1) - 'Roles and responsibilities', covered the responsibilities that each of the participants should have for the information, as well as the roles and responsibilities for the
Information Strategy itself. As noted above, this workshop also discussed ‘drafting the information strategy framework document’.

The final workshop - (Workshop 7 in Table 8.1) was ‘Monitoring and reviewing’. It provided an opportunity for participants to gain further advice and assistance on the procedures for the development and implementation of an information strategy.

For the last three workshops in particular, participants were encouraged to initiate discussions by talking about their own institutional information strategy development. They were also encouraged to think about their own priorities and information needs, and how they might build the information strategy into their institutional routines.

8.3.3 A Separate Issue Raised: Scale of an Information Strategy

At a workshop discussion, the question of scale regarding information strategies was explored, relating to the fact that information strategies frequently have small budgets but extensive aims. One representative from a JISC pilot site complained at a workshop that ‘JISC has created a distinctive instrument in an information strategy, but one whose size (in funding terms) may not be a good guide to its significance in the current context of HE change’. He continued that it seemed ‘there is a need for JISC to resolve the issue of scale, i.e. giving a realistic view of the possible mismatch between size of funding and significance.’ He added that ‘on the other hand, the boundaries of an information strategy overlap with often fundamental changes that are happening in any event in HEIs – and this can give the impression that information strategies are more weighty activities than they actually are’. He further commented that it was hard to disentangle an information strategy from other initiatives in the development of management information services, changes to policy development structures and teaching and learning initiatives, but important to do so if JISC was to make realistic calculations about their role in HEI development and about the real impact of their ‘pump-priming’ efforts. This argument led to a series of questions including:
• How much funding and human resources are devoted to information strategy at your institution?
• What are you expected to achieve with these resources?
• How easy or difficult is it for the information strategy to influence the way in which other resources are spent on information areas within your institution?
• Do major changes always require large resources, or can current resources be used more effectively?
• Where there is a mismatch between expectations and resources do you feel it is the lack of resources or too high expectations; which is the major problem?

8.4 Attendance at the Conferences and Issues Discussed

8.4.1 The Conferences

As Table 8.1 indicates, in addition to attending the seven one-day workshops on information strategy development, the researcher attended three information strategy conferences, also organised by JISC, focusing on higher education. These are outlined below.

The first Information Strategy Conference the researcher attended was held on 20th May 1999 at the East Midlands Conference Centre, Nottingham. About 200 people attended and the event involved two keynote speakers and a range of parallel sessions. The conference theme was: 'Learning from Business'. It opened with the keynote speech – 'Advantage of Information', given by the Director of Information Systems, Boots the Chemists, and was followed by several parallel sessions, and ended with another keynote speech – 'Re-establishing Trust', given by a director of Rolls-Royce plc.

The second Information Strategy Conference was held on 10th February 2000 at the British Library, London. There were 230 attendees from a range of backgrounds in UK FE and HE institutions, including network managers,
information service directors, registrars, planning officers, librarians and archivists. The conference aimed to raise questions about and suggest some approaches to the challenges of information management. A keynote speaker from the Data Protection Registrar's Office outlined the background to the Data Protection Act (1998), with an emphasis on the nature of the law as well as its technicalities. The parallel sessions at the conference covered various aspects of security and access issues and described work being done in the sector. The topics included the potential responses to legislation, cultural issues behind the use of technology, the legal relationship between an institution and its students, the processes by which we communicate within and between institutions and with the outside world, and the way institutional records ought to be managed. The conference also discussed such issues as networked information and widening access to information. The conference ended with a presentation from the Policy Manager of the Freedom of Information Unit of the Data Protection Registrar's Office.

The third Information Strategy Conference the researcher attended was held on 7th December 2000 at the Queen Elizabeth II Conference Centre, London. This conference explored the economic use, development, dissemination and exploitation of information within the FE and HE environments. The conference, themed as 'Focus on Funding', looked at the implications for institutions of funding policies, and how these might affect institutional decision-making relating to access and ownership of information. The parallel sessions run at the conference included: cost-benefit analysis, the costs of networked learning, costs of accountability, and tangible benefits of information strategies and purchasing decisions on electronic resources by HEIs. There was also a discussion on the Data Protection Act (1998) and its implications for the way institutions manage sensitive information.

The main objectives for attending these conferences were to get to know key people who were in charge of information management at various HEIs so as to facilitate the follow-up contacts for this research and to add to the breadth of information from other HEIs and from other business organisations on the topic of information strategy.
8.4.2 Key Issues Raised at the Conferences

At these three conferences, in addition to the main topic on information strategy development mentioned above, some other issues regarding information strategies were also raised. The main ones are as follows.

A. Information Strategies: Informed by Educational Values?

One of the conference presentations noted that ‘experience with previous evaluation of IT development for education had shown that under pressure of deadlines, typically restricted budgets and production values (e.g. elegant software interfaces, user interactivity) educational considerations are easily displaced. Courseware development, for example, rarely lives up to its educational promise – albeit elegant packages are often produced’. It added that ‘such developments tend to be dominated by productivity concerns more than by criteria for what counts as good educational instruments’. It also noted ‘a potential vulnerability in information strategy initiatives to the same thing’. This led to the questions such as:

- How does your information strategy support your educational mission?
- What links are there between your information strategy and your teaching and learning strategy, and which is the driver?
- Is the use of technology in teaching left to the personal preferences of academic staff or are strategic decisions taken?

B. Plagiarism Detection, and Copyright

At one of the conferences, an exploration was conducted on the issue of the practicalities and implications of the plagiarism detection software developed by the University of Glasgow for checking student assignments in computer programming. This university’s experience emphasised the need for a security culture. A discussion was followed on the question ‘whose responsibility should it
be to detect and deal with plagiarism, and how should institutions respond to this growing problem?'

Electronic distribution and delivery offer new possibilities and challenges to both readers and publishers. Publishing used to be a capital-intensive activity, but web publication and access are possible for everyone. Copyright issues, therefore, are now difficult to avoid. The discussion was focused on how to manage scholarly resources in this new environment, and attention was drawn to the 1988 Data Protection Act. For example, under this Act, HE photocopying may be covered by ‘fair dealing’, course pack licensing, special permission, or under library privileges. However, there is the other side of copyright – while the 1998 Act stated that ‘rights go to employer’, institutions may decide to give rights to their employees in the contracts; or they may not mention copyright at all so as to save administrative work, and to avoid arguments about academic freedom. In addition, the EC copyright directive contains a possible threat to fair dealing, and to library privilege; and there might be threat from technical protection of systems. Therefore there is a need for institutions and staff to act together. Otherwise the cost of neglect might be publications (especially journals) become unaffordable and the collapse of the system of scholarly communication. Participants were warned that ‘publishers are in a weak position and if nothing is done an anarchic alternative will emerge’.

C. Security Culture

The second conference also discussed the issue of security culture. Institutions wanted to promote ‘openness’ as an ideal, to share information through an intranet and the Internet and to let their students and staff have an unrestricted IT environment to work in. But not all people can be trusted. There might be insider threat and students may have time and skill to hack. The participants were concerned that their systems may be as technically secure as they could wish but ‘it is the way in which people use (and abuse) them which can still lead to difficulties’. Therefore information such as minutes of confidential meetings, personal records, licensed materials and systems through which money
is spent might be at risk. In addition there are issues in virtual learning environments. While institutions are encouraged to create a supportive environment, there exist the risks of malicious impersonation, impersonation in submission of assessed work and plagiarism, violations of privacy and attacks on the whole system. Participants were also led to think about 'the main difficulty institutions find in generating a security culture'. At one of the conference discussion sessions, such topics as risk assessment, culture and behaviour, responsibility, policy, funding, security classification, security mechanisms and privacy were also covered.

**D. Networked Information**

At the second conference it was agreed that 'universities both generate and use an increasingly diverse range of networked information – from online teaching material to administrative records'. However the participants accepted that 'where there is push for open access there is an equal need to control who accesses what, and what they can do with the information they access'. It was pointed out that 'existing solutions to access control, such as Internet Protocol (IP) address checking and password systems are inadequate', and that 'better solutions could offer many benefits such as personalised services, off-campus services, better consolidated management information' and so on.

**E. Widening Access to Information**

Also at the second conference institutions were encouraged to be 'more entrepreneurial in their management and exploitation of information', and the participants agree that indeed they hold 'a wide range of information of considerable value - anything from staff and student records to information about their teaching and learning. However while supporting the view that 'broadening access to these information resources may offer potential financial benefits to the institution, they worried about legal and ethical issues. So it was agreed that as information is increasingly created, used and stored digitally, the question of its
‘continuing preservation and access’ became more crucial. The question – ‘what measures can be taken’ was raised but was not answered at the conference.

**F. Ownership of Information**

At the third conference, as mentioned earlier, the participants discussed the 1998 Data Protection Act and its implications for the way institutions manage ‘sensitive’ information. At the discussion, whilst participants noticed the changes to the previous Data Protection Code, in areas such as student use of personal data where the institution is the data controller, many other issues relevant to the topic were also raised. Examples included:

- Can details about students’ registration or results be given to external bodies without the student giving written permission first? Should a record be made of any information provided by telephone?
- What assistance a university/college is allowed and required to provide in the context of the Data Protection Act regarding the Police inquiries about the addresses and identity of the suspects who may attend the institution?
- What are the implications of the Act for University records management and archival policies?

These issues were discussed by a panel of experts, including those from the Office of the Data Protection Commissioner, author of the JISC Data Protection Code of Practice, HEFCE Good Practice in Data Protection Project, and JISC Legal Information Service.

Overall, the conclusion was a need by universities to develop guidelines, and policies to ensure that the creation, storage and use of information are in conformity with external legal and regulatory requirements and with ethical standards. These include data protection, freedom of information and copyright legislation as well as software licence agreements. In addition the university also should adopt standards to ensure the secure and efficient transfer of data and effective sharing of information. Users of information should be aware of their
rights and responsibilities in relation to the handling of information and the need to ensure that access to confidential data is restricted to those who need, or have the legal right, to know.

8.5 Questionnaire and Interviews

8.5.1 Designing the Questionnaire

A questionnaire for structured interviews had originally been designed for use with the representatives at JISC workshops (see Appendix L). However, as this research project was defined as qualitative in nature (see Chapter 5), second thoughts indicated that this questionnaire would not fully meet the purpose of the investigation. As the questionnaire contained mostly 'closed questions', i.e. questions that presented the respondents with a set of possible answers to choose from, it was thought to be inappropriately designed for eliciting deeper views on the topic area as requested by ethnographic research. Therefore, the original questionnaire was abandoned and a new questionnaire was designed for conducting unstructured and/or semi-structured interviews. This is given in Table 8.5.

Table 8.5 Questionnaire for Semi-/Un-structured Interviews in Ethnography II

1. What is your role at the university? Why you are here (at JISC’s workshop)?
2. Does your institution already have a documented IT strategy and an IS Strategy? If ‘No’: Is your institution developing an IT Strategy and an IS Strategy?
3. Does your institution already have an Information Strategy document as distinct from an IT Strategy and IS Strategy? If ‘No’: Is your institution thinking about developing an Information Strategy? If ‘Yes’: What are the reasons for your university’s Information Strategy development? What do you think ought to be the main reasons?
4. Is centrally held information duplicated at any level? Why is this so?
5. Who initiated the information strategy development in your institution?
6. (In your opinion) Is it a good thing to develop such a strategy? Why?
7. Who is responsible for developing the information strategy at your university? If
   the answer is ‘A committee’: How are the committee members appointed? Who
   are represented on the strategy committee? Are you happy such a committee
   structure? Why or why not?
8. Do you have a separate implementation committee for the strategy? If ‘Yes: Is
   this a good thing? Why or why not?
9. Who or which group does the Information Strategy Group report to? Why?
10. Is there any individual who is regarded as the main proponent for the principle of
    an information strategy? If ‘Yes’: Who is this person? Why is this so?
11. What are the key issues that have been raised during the development of an
    Information Strategy? How have these been dealt with?
12. How would you describe the process so far? Are you happy with it? Why or why
    not?
13. How long is your information strategy planning cycle? How was this decided?
14. What methodologies or models have been used in the process of information
    strategy development? Have they been useful? If not, could any other method
    have produced a better outcome?
15. Has any ‘outside help’ been brought in to aid in the development of the
    information strategy? If ‘Yes: What was their role in the process?
16. How radical do you /did you expect the impact of an information strategy to be
    on your institution?

In designing this second questionnaire for the ethnographic research,
attention was given to the ‘creative process’ informed by Total Systems
Intervention. ‘Creativity’ was used to design the questions that would elicit deep
perceptions of the respondents to the problems under discussion. So it was
intended in the questionnaire that instead of having the respondent passively
select an answer from a multiple choice questions (such as those in Appendix L),
the respondents were encouraged to think about the answers for ‘how’ and ‘why’
questions above. The respondents were encouraged to talk from their personal
experience and to express their real perceptions about the issues under
investigation.
8.5.2 Selecting Participants and Conducting Interviews

The researcher took advantage of being at the JISC workshops and conferences and established links with 80 representatives from 28 UK HEIs (see Appendix M). However some initial attempts made by the researcher to approach the potential interviewees showed that not everyone on the list was willing to cooperate or could make a commitment for the interview. So it was decided that the following criteria should be met in selecting HEIs and participants for this ethnographic research:

a. The institutions chosen must have developed an institutional information strategy;

b. The institutions chosen must reflect the diversity of higher education;

c. The people selected for interviews must be well informed of the information needs for HEIs;

d. The people selected must have had rich experience of working in higher education;

e. The people must have shown their commitment and enthusiasm in the participation and co-operation with this research project.

Therefore, largely based on these criteria, during a period of about ten months, from February to December 2000, the researcher managed to conduct interviews with 25 participants from 16 UK HEIs, although more people in my list had been approached. These interviewees were later found to be mostly in charge of the information strategy development and implementation in their institutions.

All the interviews were taken in London on the days when we met for workshops and conference. All the interviews were based on the pre-designed questionnaire in Table 8.8, but flexibility was allowed based on the conversation, so these could be called semi-structured or unstructured interviews. As the interviews were mostly conducted during tea/lunch breaks and at the end of the workshops and conferences, the time taken for each interview was a bit restricted,
with an average length of about 15 minutes, shorter than the average time for either the Action Research interviews (20 minutes) or Ethnography I interviews (25 minutes). However, various expert views were collected on a much wider perspective regarding the development and implementation of information strategies in HEIs. These are summarised in the following section.

Note that for the individuals whose comments are used in the following section the name of their institutions are indicated (where appropriate) rather than their own names in order to preserve the individuals’ privacy.

8.6 Summary of Key Comments from the Participants

Many comments were heard during the interviews, and this section summarises the main and representative ones on the topics given below. These are subtitled as:

(1) Confusing terms on IT and IS
(2) Defining an information strategy
(3) Reasons for having an information strategy
(4) Misleading views on information strategy
(5) Developing an information strategy – how
(6) Implementing an information strategy
(7) Issues on information access, sharing, quality and responsibility

8.6.1 Confusing Terms on IT and IS

When answering the 2nd and 3rd questions in the questionnaire, King’s College London noticed that there was a tendency to use the words information technology (IT), information systems (IS) and information rather interchangeably, and that they are actually quite different. The University of Hull supported this, and stressed that it was important not to confuse an information strategy with information systems strategy. It further explained that ‘the latter remains in a sense bound by technology and is always in danger of lapsing into an
unprioritised wish list of services and facilities. These are not explicitly based on an understanding of the fundamental processes that the institution undertakes, nor of the information flows associated with those processes’. The University of Hull maintained that an information strategy has a different purpose. In the first place it is ‘a means of promoting an institution-wide understanding of the vital importance of managing and exploiting information resources effectively’. Most other respondents had similar feeling on these confusing terms.

8.6.2 Defining an Information Strategy

Different institutions defined information strategy differently but they all focused on the effective management of their institutional information. The following statements are chosen to demonstrate the various universities’ understanding of the term.

- The University of Hull: ‘An information strategy is concerned with the good management of information in the university. Effort should be made to relate the Mission Statement of the university to issues of information management and use. The information strategy should show the absolute centrality of exploiting information resources to the full as a means of fulfilling the university’s mission’.

- Kings College: ‘The information strategy is a corporate activity. It involves every element of the institution. It affects and influences everybody. It is concerned primarily with how the university should provide for its information needs for the foreseeable future. An information strategy should permeate the whole organization and all of its activities.’

- University of Glasgow: ‘An information strategy is about communication and sharing information. In any form of communication the participants need to talk the same language for it to be effective. To exchange information reliably requires the existence of an agreed protocol between the parties concerned. For institution-wide exchange, it helps if a common
set of protocols is in use. The objective is to facilitate communication and information flow and not to constrain what people can do.'

- JISC: ‘The objectives of the information strategy is to help the institution achieve its Mission. This can be done by providing a focus for information issues and ensuring [that information] the most fundamental educational resource be created, maintained, used and exploited efficiently and effectively for the benefit of the institution.’

8.6.3 Reasons for Having an Information Strategy

University of Sheffield explained the reason for having an information strategy, saying that ‘The impetus for most HEIs in the UK currently developing information strategies is coming from, on the one hand, internal factors such as the reduction of resources and increasing student numbers, and on the other hand, external factors, such as a change in orientation of the main funding body moving from information technology strategies to information systems and information strategies, and hence the funding body’s pressure for their development is also playing an important role.’ This is a good overall explanation for having an information strategy to which most other respondents appeared to be in agreement when the same question (part of question 3) was asked.

8.6.4 Misleading Views on Information Strategy

Misleading views on information strategy was one of the key issues raised regarding the development of an information strategy (refer to question 11). Harper Adams University stressed that ‘one of the dangers with information strategies is that they concentrated on the electronic transmission of information and neglected all the other forms of information’. Brunel University supported this, saying that ‘while there are many examples of innovative use of electronic materials, in other areas non-electronic material may still provide the best (or only) means of satisfying information requirements. No intrinsic superiority should be assumed for either electronic or non-electronic information sources.’
8.6.5 Development of an Information Strategy – How

All universities are different. Each should have its specific way for its information strategy development (refer to question 14). However, the following comments expressed views that could be shared by other HEIs:

University of Essex maintained that a university should consider simple things such as looking at the information flow, the forms that are used, what people actually do, the relevance of processes that, although having been there for years, can affect the economy and efficiency of the organization.

Strathclyde University suggested that information strategy development start with a draft information strategy which will form the basis for the development of a more detailed strategy and implementation plan.

University of Glasgow considered that the starting point in developing an effective information strategy is a recognition that the resource gap cannot be solved by simply transferring information to computers but that it involves a close examination of the way in which information is discovered, received, collected, processed and disseminated.

University of Leeds realized that different groups in organizations have different interests and they will need and use information differently. Thus, it is important to determine and prioritise information needs before an information strategy can be fully developed.

8.6.6 Issues on Implementing an Information Strategy

To the issues on implementing an information strategy (refer to questions 8, 9 and 10), many interesting conversations were made with people at the interviews. However, the following findings from the discussions are considered important:

University of Glasgow expressed the view that the information strategy document serves only as a starting point in a dynamic process, the details of which will change as the higher education environment evolves.
University of Sheffield stressed that an institution should ensure that information is delivered where and when it is needed through clearly defined and understood communication channels.

JISC insisted that as the initial programme of projects progresses, further issues to be addressed should be identified and a further programme of projects selected. Information strategy is an on-going process and should become embedded within the institutional routines. The process is iterative and methodologies will continue to be improved and developed as the strategy progresses.

### 8.6.7 Issues on Information Access, Sharing, Quality and Responsibility

A number of universities talked about some of the difficult attitudes one must overcome in developing and implementing an information strategy (refer to questions 4, 10 and 11). These are given below:

Open University mentioned that ‘the aim of the information strategy is to facilitate the exploitation of this wealth of information’. To achieve such an aim, as stated by the Roehampton Institute London, the quality of information should be ‘fit-for-purpose - meeting necessary standards of accuracy, currency, consistency and completeness. Staff and students should each know and exercise their responsibilities towards information, whether they are generating, organising, updating, storing or communicating information’. Any information that should be appropriate for sharing is well defined and accessible, with clear definition as to who has access to what, both for viewing and for altering.

However, in practice information access and sharing were found difficult. Queen's University Belfast gave an example, saying that there are often two administrations in an institution: the official one, and one that the departments run to give them the information which they really need. ‘That is horrendously wasteful’. Information strategies tend to raise the whole issue of academic freedom versus corporate need. Information is to some extent a source of power and once you start looking at issues to do with regulation and regimentation all sorts of wider issues are raised.
University of Glasgow supported this, stressing that information which is common between areas should not be duplicated. There was a strong requirement to facilitate information sharing across teams and across the whole institution. University of Glasgow stressed that they plan to 'stimulate information sharing across the structure' replacing the now outmoded 'access restricted-to-those-who-need-to-know' redolent of hierarchies, with 'free-access-unless-need-for-restriction'.

University of Northumbria suggested that 'members of the university community expect to have access to the widest possible range of information sources. This should be done with the greatest ease of access and the fewest barriers, through the most appropriate channels and supported by the most cost-effective means.' University of Glasgow stressed that 'wider access to information opens the possibility of a better informed community', and stressed that the people who are the source of information should be responsible for its input and update. It further explained that 'if the person who is the source of information is responsible for its input it is more likely to be accurate and up-to-date as it allows them to correct mistakes or keep dynamic information current.'

8.7 Suggested Actions

Regarding the actions to be taken for the development of an institution-wide information strategy, many sensible suggestions were made by the interviewees. These included:

- 'Strategy needs to inspire staff and be integrated into performance measures and action.' (Worcester University)
- 'Work with the existing information projects within the university to help an information strategy to develop through their re-analysis of information needs in specific areas and help them fit together as part of a coherent whole.' (University of Glasgow)
- 'Organise meeting with students and visit other institutions.' (University of Luton)
• 'Conduct an ongoing programme of widespread consultation with staff and students in the university to keep the information strategy developing according to the needs of everyone in the university.' (University of Glasgow)

• 'Produce a series of briefing papers on a number of information topics to develop understanding of key issues to promote best practice, and disseminate them widely throughout the university.' (University of Glasgow)

• 'Present information strategy awareness seminars aimed at all levels of staff which will introduce and define the main policies of the information strategy and foster ownership of the objectives.' (University of Glasgow)

• 'Sharing of good practice – examples of the effective use of information that touch the everyday activities of a wide variety of people to be used in awareness raising.' (Writtle College)

• 'Identify the areas of standardisation and protocol which are required to move forward on an information strategy.' (University of Glasgow)

• 'Monitor the institutional priorities and external contexts in which the information strategy operates.' (JISC)

• 'Allocate adequate funds to the implementation of the strategy.' (University of Glasgow) - the University of Glasgow had a central fund for initiatives from which the information strategy project had benefited.

• 'Once the information strategy has been developed and implemented it should be promoted, monitored and maintained in such a way as to ensure that it becomes embedded in the workings of the institution and aligned to changing institutional needs and priorities.' (Roehampton Institute London)
8.8 Critical Reflection of Ethnography II and the Development of Revised Framework I

8.8.1 Reflections on the Evaluative Framework Drawn from Ethnography II

Participant observation in the JISC workshops and conferences on information strategy development widened this researcher’s understanding of the information strategy process, already being gained from Ethnography I, to include perspectives held across a significant number of UK HEIs. At these meetings there was considerable, though by no means universal, support for the general notion of the benefits from information strategy development. There was also confusion over how such a strategy might be developed.

There was additionally an apparent ‘emancipation’ issue. All delegates to these meetings were representatives of HEIs’ information strategy development committees, but some delegates felt they were being ‘sent to these meetings’ without their personal sympathy with, or support for, the process being discussed. Such ‘power-structure’ issues would need addressing (going back to the ideas of Foucault) if an agreed ‘truth’ about the strategy development process were to emerge.

However from the point of view of this research, perhaps the key point emerging from these meetings - indeed already apparent in the early JISC’s documents - was the lack of any theoretical underpinning to the development and implementation processes of such information strategies. This highlights the importance of the links between each of the individual elements in the Evaluative Framework (Figure 4.7) and the information strategy under evaluation. In the Framework, it is intended that underlying social, system, and management theories be accessible from the relevant framework elements, where these lead back to the discussion of the appropriate theory summarised in Chapter 2 (also see Table 4.6 on page 143).

In the case of JISC Guidelines by contrast, a fairly standard ‘mechanistic’ approach to strategy development had been proposed at the outset and this was reflected in many of the discussions at the workshops. The case for this should not
be overstated, as JISC did talk about holding focus-groups meetings and using questionnaires across an HEI to elicit ideas, perceptions, grievances and expectations about a proposed information strategy. But as mentioned earlier, the bulk of JISC documentation and discussions centred on mostly top-down, prescriptive approaches to the development and implementation of information strategies.

8.8.2 Critical Systems Thinking as Applied within Ethnography II and the Development of Revised Framework 1

A new evaluative framework – revised framework 1 - is presented as Figure 8.1. This Framework now has explicitly at its centre the HEI’s ‘Information Strategy’, as implemented. Within this strategy there are two main sections: the bodies within or associated with the HEI that use the information covered by the strategy (and where these bodies frequently also generate this information); and the institution’s information systems. This latter section contains the institution’s information, the wide variety of technologies and systems that handle this information, and also the staff directly employed in running these systems, for whom the information is not part of a wider end purpose.
The reason for making this change was that this researcher's experience at the JISC workshops and conferences suggested that an information strategy at a HEI should be seen as a process rather than an outcome. This process starts with the three main areas identified in the Framework of Figure 4.7 - control structures, external environment and internal environment, where these are subdivided into the generic elements as listed in the framework. Then, as discussed in this and the previous sections, critical systems thinking procedures need to be brought to bear on these elements when evaluating the information strategy as actually developed.

In the case of the 'control structures' the critical awareness ideas of human-centred inquiry, emancipation and appropriate choice are required for strategy development and implementation; in the case of the 'external environment' and 'internal environment', social awareness and appropriate choice are required for the analysis methodologies. When evaluating an existing information strategy, a similar choice of methodologies and approaches is required as for the development and implementation phases, if the operation of the strategy is to be fully understood and remedies suggested. The underlying idea here is that as an information strategy is evaluated, critical systems thinking concepts should formally be incorporated into the process.

8.9 Summary and Conclusions

Participant observation in the JISC workshops and conferences on information strategy development widened this researcher's understanding of the information strategy process to include perspectives held across a significant number of UK HEIs. At these meetings there was considerable, though by no means universal, support for the general notion of the benefits from information strategy development, and also confusion over how such a strategy might be developed.

There was an apparent 'emancipation' issue, in that some delegates felt they were being 'sent to these meetings' without their personal sympathy with, or
support for, the process being discussed. Such ‘power-structure’ issues would probably need addressing if an effective strategy development process were to result.

Perhaps the key point to emerge from these meetings (already apparent in the early JISC documents) was the lack of theoretical underpinning to the JISC’s development and implementation processes. In the Evaluative Framework of Chapter 5 it is intended that relevant social, system and management theory be accessible from the framework elements. In the case of JISC Guidelines, by contrast, a fairly standard ‘mechanistic’ approach to strategy development was proposed at the outset, and was reflected in many of the discussions at the workshops. This should not be overstated, as JISC mentioned the use of focus-group meetings and questionnaires to elicit ideas, perceptions, and expectations about a proposed information strategy. But the bulk of JISC documentation and discussions centred on mostly top-down, prescriptive approaches to strategy development and implementation.

The outcome of ethnography II is the generation of Revised Framework 1 (Figure 8.1) for assisting information strategy evaluation, which has explicitly at its centre the ‘Information Strategy’ as implemented by the evaluating HEI. This change has stressed that an information strategy at a HEI should be seen as a process rather than an outcome, and that this process starts with the three main areas identified in the initial Framework - control structures, external environment and internal environment, where these are sub-divided into the generic elements as listed in the framework. Then critical systems thinking procedures are interposed between each of these elements and the information strategy as developed, and it is stressed that all the elements in the strategy should be looked at as parts of a whole ‘system’, i.e. within the larger system of the university as a whole.
CHAPTER 9

CASE STUDY – INVESTIGATING THE IMPLEMENTATION OF AN INFORMATION STRATEGY
CHAPTER 9
CASE STUDY – INVESTIGATING THE IMPLEMENTATION OF AN INFORMATION STRATEGY

9.1 Introduction

The final piece of empirical research carried out for this project was a case study which was concerned with the investigation of the development and implementation of the information strategy at another UK HEI.

The main reasons for choosing this university for the case study research were as follows:

(1) It was one of JISC’s pilot sites for information strategy development;

(2) It had well-developed information systems and was recognised to have successfully developed an information strategy;

(3) It was at a mature stage in implementing its information strategy and could be an example of best practice, therefore it had good potential to offer theoretical insights;

(4) There had been special links to the university via the external research supervisor, and previous contacts had been made with key information managers at JISC’s meetings and conferences on information strategy. All these helped facilitate the investigation process.

The main objectives of the case study were to investigate the success of the implementation of an information strategy already in place by reviewing available documents and conducting semi-structured interviews; to identify and analyse key factors which accounted for the success or failure of the different elements in the strategy; and to provide an additional opportunity to use Critical Systems Thinking ideas to reflect on the Framework and in return, to revise it.
Main topics discussed in the following sections include:

- An overview of the case study university
- The case study design
- The investigation process of the case study
- Findings from the case study
- Critical reflection of the case study and the development of revised framework 2

9.2 Overview of the Case Study University

The University of Hull is a traditional redbrick university which was founded in 1927. It used to be a college of the *University of London* until it achieved its independence in 1954. It has three campuses with over 1,800 staff and around 18,000 full and part-time students. Over 10% of them are from more than 100 overseas countries.

The university runs a two-semester system, with modularised courses at degree, certificate and diploma level in its four faculties - Arts and Social Sciences, Health, Sciences, and the Institute for Learning. Each faculty is headed by a Dean with budgetary responsibilities. This university is well known for its "excellence in teaching and research, with a reputation as one of Britain’s friendliest universities and a proud record for the care of its students" (Source: http://www.hull.ac.uk).

The university’s Mission Statement, set out in its Strategic Plan for the period 1995-2000, can be summarize:

‘A recognised centre of excellence in teaching and learning; an internationally recognized source of high-standard postgraduate education and training in areas of specialists expertise; a nationally recognised centre of research excellence, with international recognition in selected specialisms; financially broadly-based with a variety of sources of finance to sustain academic activities; a partner with other agencies in the economic, social and cultural development of the city of Hull and the surrounding region.’
The university started to develop its information strategy in 1994, prior to becoming a JISC’s pilot site for information strategy development in 1996. Four years later, it published its document - *The General Information Strategy* in 1998. The strategy has been in implementation since then.

9.3 The Case Study Design

To facilitate the investigation of the case study, two comprehensive charts (Figures 9.1 and 9.2) were designed. Figure 9.1 is a flow chart showing the overall design for the case study at the University of Hull. Figure 9.2, derived from Figure 4.7, is a chart designed as a guide to possible ‘mismatches’ that might have occurred between the information strategy as envisaged and as actually implemented. Both charts are seen as useful guides to a potential evaluator/investigator for planning and implementing the evaluation of an information strategy. Both diagrams are largely self-explanatory, however, the following sections give more details of the process of the case study investigation as carried out.
Collect relevant documents

Get an overview of the institution

Refer to the evaluative framework of Chapter 4 (Figure 4.7) and identify potential problems with Hull's information strategy

Review the documents

Find out how the information strategy was generated

Investigate the progress in implementing the strategy

Make contacts for conducting interviews at the university

Does implemented strategy follow documented strategy?

Ascertain how the information strategy was developed and implemented through the interviews

Conduct semi-structured interviews based on a pre-designed questionnaire

Are there any major Problems?

Refine the Evaluative Framework for Information Strategies or review

No

Does the information strategy follow documented strategy?

Yes

Are the mismatches critical?

No

Are there any major Problems?

Critical reflection of the findings from the investigation

Yes

Yes

Clarify the mismatches

Identify main causes for mismatches or problems

Figure 9.1 A Flow Chart for the Case Study Design
Figure 9.2 Checklists for Possible Causes of Mismatches in Implementing an Information Strategy
9.4 The Investigation Process of the Case Study

9.4.1 Reviewing Documents

As indicated in Figure 9.1, a review of relevant documents was the first stage in this case study. In addition to the university’s information strategy document itself, other published documents on or related to the university’s information strategy were also collected from various sources and reviewed (see Table 9.1).

Table 9.1 Key Documents Relevant to the Information Strategy Development at the University of Hull

<table>
<thead>
<tr>
<th>Name of the Document</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. Mission, Aims and Themes of Academic Services, and Annual Operating Statement for 1997/98</td>
<td>The University of Hull (Web site)</td>
</tr>
</tbody>
</table>
9.4.2 Planning for the Interviews

With the document review completed, the next stage was to plan visits to the University of Hull for semi-structured interviews. It was hoped that by being in the ‘field’ and having face-to-face interviews with people in the university the researcher could have a better understanding of the perceptions and feelings of those involved and affected by the information strategy already in place. Also a more detailed picture of how the university had implemented its information strategy might be gained. However partly because of the geographical distance and partly because most of the people contacted were very busy, setting up meetings was not easy. Nevertheless after much effort this researcher did conduct a sequence of interviews at the university. Figure 9.3 shows the steps involved in setting up these meetings. Having gone through these a number of times, phone and e-mail, contacts were made with over 20 people at the university. Eventually 12 people gave interviews for this case study. Sample letters sent by e-mail and by post to two of the interviewees are shown in Appendix N.
Draft a letter to the University of Hull’s Information Manager expressing the importance to this research of their co-operation

Get approval of the Director of this research

Send the letter by email - initial contact for this investigation

Follow-up contacts - phone calls made to confirm the possibility of visiting the University

No

Contact other relevant members of the institution

Repeat the above processes

Visit Hull and conduct interviews

Yes

Confirm the time and date of visiting and establish links with other people to be interviewed

Prepare semi-structured questions

Figure 9.3 Plan for Setting up Interviews for the Case Study

9.4.3 The Questionnaire and the Interviews

In preparation for the visits to the University of Hull, a detailed list of questions was drawn up for use at the semi-structured interviews. These questions were arranged to closely match the elements listed in the evaluative framework of Chapter 4 (Figure 4.7), so covered major headings like 'control structures', and 'external' and 'internal' environments; and the range of subheadings underneath these categories. Questions (see Appendix O) were designed to elicit straightforward responses about what procedures were carried out and which aspects were successful, and which were judged less so (i.e. covering Habermas' 'technical' interest); questions about theoretical approaches adopted or at least
considered; ‘is’ and ‘ought’ questions to elicit respondents’ views about what might have been done differently; and questions about human interactions and the location of power and control (including information ‘ownership’) to cover Habermas’ ‘practical’ and ‘emancipatory’ interests.

Note that the use of this list of questions was in contrast to the questionnaire employed for the Action Research in Chapter 6. In the Action Research, the questionnaire was deliberately kept fairly short, and sent to respondents before the interviews. In this case study research the questions were not sent to interviewees ahead of time, but used by the researcher as prompt for questions and for lines of investigation as each interview progressed.

For this case study, 12 people (Appendix P) were kind enough to cooperate with this research and gave interviews of about 30 minutes. Two of these took part in longer discussions of about 90 minutes each. They were both senior Information Managers who provided information on behalf of the institution.

By reviewing relevant documents and conducting these semi-structured interviews, the researcher gathered a lot of useful information about the development and implementation of the University’s information strategy. The next section presents the key findings from this case study research.

9.5 Findings from the Case Study

9.5.1 The Development of the Information Strategy

The case study research indicated that, like many other UK universities, the development of the information strategy at the University of Hull took place against a background of considerable institutional change. This university had new academic structures (students were allowed to choose their own modules), a new organizational structure (the faculty structure), and increased student numbers (from 7,000 in 1990/91 to 12,000 in 1999/2000).
A. The Starting Point

The university's Information Strategy Review Group (ISRG) started its strategy development by concentrating on organizational and management issues. So from the outset they looked across the whole university with a view to developing a strategy that would encompass the full range of its information activities, and considered matters relating to the effective management and exploitation of its information resources. The ISRG developed a strategic approach to information management and insisted that the introduction of new IT solutions must be preceded by a fundamental reappraisal of information flows underlying the institution's key business processes. Thus the group began by reviewing the existing IT Strategy as a means of laying the foundations of a wider-ranging information strategy.

B. The Development Process

Based on the document review and the interviews with selected participants from the University of Hull, Figure 9.4 shows in flow chart form the development of the university's information strategy, including issues raised and how these were tackled. As can be seen, this chart gives a detailed overview of the information strategy development process.
Development started in 1994 → Information Strategy Review Group (ISRG) established in the same year → Became a JISC pilot site in 1996 → ISRG reconstituted in 1997 - a senior committee of 12

Serious problems with administrative computing identified → Assisted by a senior executive of ICL Plc. → Related the University's Mission Statement to issues of information management and use

ISRG given responsibility for the resolution of the university's information problems → Review the existing IT strategy → Stressed on the need to develop a strategic approach to information management

Focussed on the structure of the university's academic support services → The 1st Report published in 1994 → Examined the importance of effective exploitation of information resources

Led to creation of a unified Academic Services organization, incorporating libraries, computing, corporate systems and T & L support → The 2nd and 3rd Reports published in 1996 → Identified 12 major functional processes

Made recommendations for procedural changes, accepted and implemented → The 4th Report: Corporate Systems Development Strategy published → Insisted that new IT solutions must be preceded by a fundamental reappraisal of basic information processes

Generated prioritised user requirement statements that fed into the planning of the redevelopment of the SRS → Final Report on the 7 Consultative Workshops in 1997 for discussing the documents and testing their validity → Gave ISRG budgetary responsibility for implementing the Information Strategy

Stressed ISRG's responsibility for implementing the Information Management System and GIS → Produced 8 documents → Appointed two Information Managers

The final document - The General Information Strategy (GIS) published in 1998 → Identified 8 processes for Information Strategy implementation → Focussed on the processes underlying the SRS because of the critical short-term needs

Consulted relevant sections, Schools & Departments

Figure 9.4 Development of the Information Strategy at the University of Hull
C. Key Achievements

Appendix Q is a summary of the information management principles proposed by the University of Hull. Based on these principles, the University had made some significant achievements as a benefit of having an information strategy. The following are highlights of the key achievements (Source: University of Hull, 1998):

(1) Twelve key operating processes were identified - academic planning, marketing, the resourcing of course modules, franchising and subcontracting, human resource management procurement, course development, admissions and registration, the delivery of course modules, research, financial processing, and estates maintenance and development.

(2) The structure of the university’s academic support services was identified as the institution’s priority issue (as there were problems in administrative computing within the university).

(3) The processes underlying the university’s student records system were focused upon (because of critical short-term needs of examinations, graduation, registration, etc.).

(4) Two Information Managers were appointed in recognition of the necessity to introduce a liaison function between system users and system developers.

(5) Eight major information-handling processes were identified and the relationships between the processes and sub-process, and the information inputs and outputs were specified. The resulting matrix identified the operational responsibility and accountability for each sub-process and showed which individuals could create, modify or access specific information outputs.

(6) A report was produced for each of the eight processes which provided an assessment of each sub-process to consider its effectiveness and identify any problems. Suggestions were then proposed to remodel the process to improve effectiveness. The anticipated benefits were set out, and a technology check was
performed to ensure that the suggested improvements were technologically feasible.

(7) A series of seven consultative workshops were then held to discuss the documents and to test their validity which included a wide range of academic, academic-related and administrative staff of the University.

(8) A set of recommendations for procedural changes was produced and a prioritised set of user-requirement statements was generated that fed into the planning of the re-development of the student record system. Examples of the procedural changes included:

(a) Responsibility for the creation and maintenance of most student data was devolved from the central administration to individual faculties.

(b) Three inefficient and time-consuming layers of approval in relation to the validation of new programmes of study were abolished.

9.5.2 The Implementation of the Information Strategy

Through the case study at the University of Hull many interesting issues emerged from the implementation of its information strategy. Perhaps the main one relates to the opening-up of the Central Administrative System as part of the whole institution’s approach to developing an information strategy. This is discussed next, and is followed by brief discussions of some other aspects of the information strategy implementation.

A. Restricted Access versus Shared Ownership and Responsibility

One respondent (Ref. No. CS-010170 in Appendix P) commented that in the past, as no users outside the central administration at the university could access its Central System, any changes to data in the student records were made by central administration and checked by means of computer printouts with the student’s home department. The department’s contact with the record was indirect — via printouts and messages. As a result various problems appeared. For example,
the departments had no direct view of the Central System and were not able to check directly whether changes had been correctly entered. And as student numbers and the range of data items in the system increased, the staff working for the Central System struggled to handle the quantity of transactions needed.

Moreover, as one interviewee (Ref. No. CS-010175 in Appendix P) explained, those putting data into the system were rarely in a position to assess its quality, had no time to question it and could add little value to the process, while the departments had little motivation to assure the accuracy of central records. Nobody in the university was empowered to monitor or evaluate the quality of the data. As excessive activities were devoted to passing messages in order ultimately to update a central system that relatively few people could see, those who could not see the central system were unlikely to concern themselves with its importance. In order to function internally some departments were motivated to set up independent record systems based on paper or on computer.

Regarding the university’s Central System, one of the respondents (Ref. No. CS-010166 in Appendix P) commented: To overcome problems caused by the system the university opened it up and allowed its users to view the system. Thus users appreciated the system’s significance more and were more able to perceive their own role in maintaining the information base. Even where they could only view (but not change) the information, they could at least confirm that the data set was being maintained and that their messages had correctly reached their destination. It was found that ‘allowing access to information is effective in that errors can be easily identified and corrected’. Moreover, in some instances responsibility for data maintenance were separated from responsibility for the processes. For example, particular student data items were assigned to departments for maintenance but with central offices exercising a quality control function by monitoring how completely the maintenance had been carried out.

It was found that users fully understood that there were different levels of access and restrictions according to the category of student and type of data. Users could only see what they were specifically authorized to see and only change what they were authorized to change (Ref. No. CS-010169 in Appendix P).
As different departments were responsible for different data there was a certain amount of peer group pressure: when users who are viewing data consider that what they are looking at is not being properly maintained by colleagues, then the matter is raised via a formal or an informal route. This introduced a sense of responsibility, which was not necessarily properly recognized before. If staff were treated as responsible, the resulting product would be of a higher quality (Ref. No. CS-010174 in Appendix P).

B. From Paper to Electronic Display

As in many other HEIs, at this university the central administration staff used to spend time requesting large hard copy reports, splitting them up, putting them in envelopes for distribution to departments and dealing with edited returns when they were sent back. There was a lot of unproductive effort in this. By concentrating on the point of the exercise, which was to maintain proper information in the central record, and reducing the effort spent on the means of communication, the university achieved a much more efficient solution. Where a hard copy return was required, for example an examination candidate list, this is now generated locally from the system, rather than being sent out from the centre. The advantage of bulk printing is lost, but the physical packing and posting is removed. Lists are only printed when the departments know that they are correct and up to date. So accuracy is improved, the time delay due to postage is reduced and unnecessary chores are cut out as far as possible (Ref. No. CS-010171 in Appendix P).

C. Less Duplication of Data and Effort

One of the interviewees (Ref. No. CS-010168 in Appendix P) said that holding multiple versions of an information item is a well-known cause for disaster, as the various versions may rapidly diverge and cease to match. The fewer versions that there are, the less effort is made on keeping different versions in step with each other. At this university, a typical example of data prone to error
because of multiple versions was the students' addresses. Students traditionally could inform a number of different offices/departments of the university of a change in address and the information then failed to get through to all those who needed it. Instead of trying to get the information through to the parts it can’t usually reach, the university instead decided to store the information in one centrally accessible place and invite users to access it when they wanted. If the student lives in the University Accommodation, then the Accommodation Office deals with it, and the address is visible to those who need to see it. There is no need for multiple offices to keep similar records.

Similarly, another interviewee (Ref. No. CS-010177 in Appendix P) recommended that there should never be a need for a user to re-type basic student or course data: once these are in the system in one place, they can be used for multiple purposes, extracted in electronic format, or retrieved on printed lists. As the university noted, these changes gave small incremental gains across the university. Their impact may not always be identifiable to the extent that jobs could be rationalized, but they did boost morale. They have helped users to deal with a workload increased by additional student numbers, the changes arising from the adoption of a modular, semesterised academic structure and the increasing external demands for quality assurance. And despite increasing student numbers, there was no increase in core staff in the central registry function; indeed, one office has reduced its clerical staff from three to two.

Another respondent (Ref. No. CS-010166 in Appendix P) added that national requirements for student transcripts and support for credit transfer, not to mention HESA, meant that the Central System had to be properly current. It is a basic tenet of the university’s Information Strategy that information should not be duplicated and therefore dependence upon local systems had to be reduced. They were not prohibited, but were expected to wither away when all their functionality became incorporated into the central system.
D. More Value for Money

It was reported that at the University of Hull, by January 2001 there were over 600 users of the Academic Information System, compared with approximately 150 when it went live in 1997, and 60 users of the 1991 equivalent system. Many of these people were daily users, some occasional. Many were maintaining data for their own departments, some extracting data for management information purposes, and some viewing for ad hoc inquiries (Ref. No. CS-010174 in Appendix P).

According to the university’s Director of Academic Services (Ref. No. CS-010167 in Appendix P), a number of posts dedicated specifically to data preparation were redefined or dispensed with compared with the old Management Information System in Central administration. Almost all of the processes achieved quicker results as there was almost no waiting for colleagues to produce an output or response. As an interviewee (Ref. No. CS-010166 in Appendix P) pointed out: “If you multiply this saving of amounts of time, which might be minutes or days, by the numbers of staff who might take advantage of it, there is an enormous saving in time which will not appear on any balance sheet.” Another interviewee (Ref. No. CS-010167 in Appendix P) also noted, “where specialist planning expertise is required to create and interpret particular management information, then the process may be a little less instantaneous”.

The university’s documents made a number of other points relating to value-for-money. These are summarised as follows:

(1) There were costs associated with creating and operating central systems, but these might be regarded as investments in a higher quality, and more exploitable resource. Information management requires a staff resource. It is a resource which may be misunderstood, misinterpreted or misappropriated. But it is investment in coordination, support and management which justifies the expense. The role may be allocated in different ways, some may allocate it as another job for technical staff. This university allocated it as support for users and for the technical staff.
(2) There are overheads associated with multi-user access: user liaison became a task in itself and authorization, security and training assumed significant proportions. There was a better use of the university's overall IT resource in that, for appropriate staff, the desktop computer was supporting more chores. However, to reach this point, coordinated IT policies and procedures among users were required which had been less of an issue previously. In an institution with a degree of devolved purchasing power, imposing standards concerning IT facilities or coordinating technical support staff requires certain management input.

(3) Technical resources were devoted to supporting networked applications which might be less demanding without the devolved access to central systems, but it could not be seriously suggested that the university go without a network, so it is more appropriate to make full use of a resource to which the institution is already committed anyway.

E. Information Quality

It was believed that as a result of actions taken within the information strategy the university had higher quality of information, common standards of practice across the institution, and greater flexibility and higher quality of activity. Corporate Systems staff were more creatively employed, spending more time on development of new, bespoke software and supporting systems, less on operating, creating and running of *ad hoc* reports. The unit was allowed to be productive. This was not only an improvement in the working experience of those members of staff, but it also represented better value for money for the investment in the unit (Ref. No. CS-010175 in Appendix P). When asked about its information standards, the university's Information Manager (Ref. No. CS-010166 in Appendix P) said that although they tried to meet the standards proposed by JISC in its *Guidelines*, there were in fact virtually no indicators of data quality other than the acceptability of the annual return to the university's Statistical Record.

It was believed that the constitution and maturing of the HESA as the defining authority in all matters of data acceptability had coincided with the implementation of the university's information strategy and had provided an independent driving force towards a rigorous standard of accuracy. It was implied
that accuracy is much improved by the devolution of responsibility. Similarly timeliness was improved in that delays caused by the handling and movement of paper are removed or reduced. It was also stressed that information about students should be collected early on its lifespan of the student’s record without the need to revisit it later (Ref. No. CS-010167 in Appendix P)

F. ‘Quick Wins’

During the process of implementing the information strategy, the university had the concept of the ‘quick win’, as well as appreciating the long-term benefits of the whole new system. For each sub-system they undertook a process review, wrote this down and drew it diagrammatically. This process was very constructive.

With one system in particular, the university identified so many ‘quick wins’ that they had to set a quota on those which could be implemented immediately and those which could have to wait for the new system to be implemented. It was found that many quick wins were independent of the computerised systems and could be achieved by just a revision of working practices, while others required very small modifications to existing systems. Quick wins could bring a perceptible improvement to processes at fairly low cost. (Ref. No. CS-010170 in Appendix P)

9.5.3 Other Comments

Some additional comments were made during the interviews in connection with the implementation of its information strategy. These comments are quoted below with minor editing.
A. Issues of Management

The University of Hull was a JISC's pilot site with very well developed information systems. The development of the university's information strategy concentrated in the first instance on organizational and management issues and to a lesser extent on learning, teaching or research. The university did well in allocating responsibility for managing the information as a whole, rather than leaving it to chance.

The university believed that if information were not deliberately managed, individuals would operate according to their own standards with the time and resources available to them. Their priority is to do their own job. However this will constitute a problem, the extent of which will depend on various factors, including whether important matters are overlooked; whether individual colleagues duplicate each other's work; whether poor quality information gets in; and whether the data are not capable of being used as information. It is true that in an HEI there is a considerable risk that all of these will occur unless deliberate efforts are made to prevent them. Otherwise it all depends on individuals to be sufficiently far-sighted and understanding to protect the interests of the whole institution. However, this is unsafe in system terms unless the university has a monitoring system (Ref. No. CS-010166 in Appendix P).

B. Issues of Communications

Universities are diverse organizations. One aspect of this diversity is that it is not safe to make assumptions about how different staff or units operate, what they know, what they care about, what they discuss or communicate amongst themselves. To get any message across to the university community requires planning and effort. Communications must be considered and planned for as an objective in their own right. Similarly, training and documentation must be planned as an identifiable task within a project. There also have to be planned update and revision efforts. This does not apply only to information strategy, but is a general management issue. The university has learned a great deal about how
it deals with its own internal communications. This effort has to be considered as an investment: the cost is significant in terms of time, but to achieve the benefits of quality of information, quality of experience and cost-effective operation, it is essential (Ref. No. CS-010171 in Appendix P).

C. The Wisdom of Users as a Resource

There has been a concept of ‘senior users’ of the corporate systems since computer systems were first introduced, but traditionally such users were simply presented with a new system and told how it worked. However, if the users are permitted to contribute to the definition of a system, then firstly they add value to the specification and secondly the end product is more likely to be appropriate to their requirements.

The systematic involvement of a wide range of users in the re-engineering of the relevant business processes at the university began with the Academic Information System when a series of workshops was held on the themes of academic approval mechanisms and student registration. These workshops were targeted at different categories of user and were attended by over 60 members of staff. Later, leading up to the rollout of the Academic Information System, The University of Hull specifically promoted contacts with selected experienced users whose opinion we valued and who were typical of the wider user community. Their feedback on the implementation was essential and helped to shape much of the user interface (Ref. No. CS-010166 in Appendix P).

D. Direction at Senior Level

As one of its information management principles this university maintains a senior committee with responsibility for implementing and monitoring the Information Strategy. This committee, known as the Information and Communications Committee (ICC), receives regular reports from its project teams including an annual report on Corporate Systems development and the development plan for the new session. The advantages of having such a
committee are that the planning-development cycle sustains its momentum; that there is a regular forum for taking stock of information issues at senior level; and that there is a route into the senior management committees of the university. Management information demands a certain amount of institutional leadership (Ref. No. CS-010169 in Appendix P).

**E. Visible Planning**

Planning has a number of purposes such as to keep to the overall strategy, to set objectives for the immediate future, to ensure that those implementing the plan are aware of their responsibilities. By making the Corporate Systems annual development plan widely known outside the Information and Communications Committee, the university allows the rest of the community to know what is going on and to contribute as they see fit (Ref. No. CS-010173 in Appendix P).

**F. Users’ Expectations**

As the Information Managers were newly appointed, a wide range of consultations was undertaken early on. Some of these were unstructured “tell us your problems,” type sessions. This inevitably raised expectations that the whole range of issues would be dealt with during the first stages of development. This still elicited a sense of disappointment that these managers had not been able to tackle all of the problems which they had known about three years ago.

Users and management are generally in a hurry because they are reluctant to wait for the benefits. To deal with this, the university was honest. They published what ‘we can’t do’ as well as ‘what we plan to do and have already done’. Part of the visible planning effort is to include in the planning document all the tasks which they were aware of that need to be done. After risk assessment, prioritization and allocation of resources, they identified what it was proposed to achieve during the year.

The remaining items, which may well be more numerous than the scheduled ones, are marked “Not scheduled” for all to see. This has the effect of
disappointing those who were hoping to have their work scheduled, and there is room for discussion, but it is clear that these tasks are competing for resources. Once the plan is agreed, further requests are not usually considered until the next planning round (Ref. No. CS-010170 in Appendix P).

G. Rules on Non-Duplication of Data

As long as central systems do not cater for all needs, some independent departmental activity will continue. One principal area is “sub-module” elements where many users need to maintain spreadsheets of assessment marks. Another is where a department has non-standard ways of presenting material to its examination boards. The central system does generally meet these requirements and offers some support to local preferences but is not infinitely customizable.

Some users do more than is currently supported by central systems; for example one department has a scheduler which allocates student places on individual modules. This is certainly not discouraged, and the transfer of data between systems is as straightforward as possible. The University of Hull also sees the dogged survival of the ‘student record card’ in a number of departments. This is justified on a variety of grounds, including habit, the incompetence of colleagues or the need for the one scrap of information which is not available centrally (Ref. No. CS-010175 in Appendix P).

In recognition of all of this, this university has enabled an import/export interface with the central record which is fairly generous and accommodating. They exhort users not to keep separate data files for any longer than necessary and remind them regularly that the definitive version is the central version. This is probably being understood but there is likely to be a number of out-of-date extract files cluttering up PCs in various offices (Ref. No. CS-010166 in Appendix P).

Most of the staff at the university probably do not know that the university has developed a formal information strategy. User awareness of information issues should extend to ethical and legal considerations such as confidentiality and data protection; to the University’s own sets of guidelines and policies, such as computer misuse; to basic working principles such as efficiency and non-
duplication of data or effort and to all the detail they need to do their own jobs (Ref. No. CS-010173 in *Appendix P*).

**H. Benefits of an Information Strategy**

The benefits of having an information strategy may not include large scale cost cutting, but benefits were identified in terms of the quality of the work achieved using comparable resources. They are also identified in terms of laying foundations and creating stability, of avoiding surprises, of moving forward rather than going over the same territory more than once.

Going back to the university's original model, a strategy which was published in 1997, the university had less success in areas where responsibility for taking a policy forward has not been clearly defined. Examples are: defining the training needs of staff; where the complexities of university organization and structure have allowed competing motivations to promote local interests over global; where resources have simply not been available to take the implementation forward as quickly as it had been hoped at the outset, or to undertake detailed evaluations and audits. 'What we do stand by are the principles, the theory and the methodology: these have a degree of permanence within a dynamic and changing environment.

The University of Hull carried out process re-engineering exercises during its information strategy development and implementation. By doing so, it was found that many of the lessons learned were not specific to information but turn out to be general management issues. The common territory with human resources management was extensive. Many issues were highlighted. These included staff training, responsibility for working practices, communications with and within academic departments, and human resources strategic issues (Ref. No. CS-010166 in *Appendix P*).
I. Evaluation

Evaluation indicators are difficult to come by, but one indicator is the message coming out from the central offices of the university (who use large data sets for statutory returns) is that the quality of their data has improved where this is monitored by such offices as Planning, Research Services, Personnel and the Academic Office (Ref. No. CS-010167 in Appendix P).

9.6 Critical Reflection from the Case Study and the Development of Revised Framework 2

9.6.1. Reflections on the Evaluative Framework Drawn from the Case Study

The University of Hull has provided a useful opportunity to look in more detail at the development and implementation process of an information strategy at a university other than the university selected for the Action Research (Chapter 6) and Ethnography I (Chapter 7). The case study investigation revealed a number of useful lessons, as have been listed in the previous sections.

From the perspective of this researcher the main factors that accounted for the successful implementation of University of Hull's information strategy appeared to be:

(1) The university not only followed the JISC's Guidelines, but also gave a high level of commitment to the process, and allocated a reasonable level of resources.

(2) As one of its information management principles, the university maintained a senior committee with responsibility for implementing and monitoring the information strategy. This committee, known as the Information and Communication Committee, received regular reports from its project teams including an annual report on the corporate systems development and the development plan.

(3) Importantly, a decision was taken to devolve responsibility for information quality away from the centre, passing this responsibility out to
departments and individuals. This has not only improved information quality, but in 'soft-system' terms 'closed the human loop' by giving people ownership of information and also a professional sense of partnership with the information provision process across the university.

(4) Though there was no recourse to specific social theory, considerable effort was expended in bringing staff 'on-board' with the information strategy development process (see the sub-sections B, C and E in Section 9.5.3 above). It was recognised that this effort was large, but so were the benefits. These not only reflected on the information strategy process, but also translated across to improving management expertise within the general university functions.

(5) Early success in implementing the information strategy was helped by the identification of numerous 'quick win' opportunities, many of which involved only minor procedural changes, and did not require change to existing computer systems.

The above are all important lessons, and in terms of applying the evaluative framework of Chapter 4 (Figure 4.7), they bear directly on many of the aspects uncovered in the previous empirical research investigations reported earlier in Chapters 6 to 8; for example, organisational culture and structure, resource management, information needs analysis, and management of strategic change.

But this university, with a successful information strategy in place, also gave the opportunity to look at the framework's 'evaluative' elements, the monitoring, reviewing, and evaluative structures. Here the process seems to need further work. Like JISC's wider attempts at information strategy evaluation, the university found this was not a simple issue (see subheadings 'H' and 'I' in Section 9.5.3 above). When information was available on the quality of data (for statutory returns) it was good to see that data quality had improved. But in terms of general monitoring of people's satisfaction with the data and the systems, and at a somewhat deeper level, monitoring of data providers' and users' understanding and involvement in the aims and philosophy of the information strategy, it seemed that no regular procedures were in place. Given the 'human-centred' aspects of an information strategy, it seems probable that a critical
systems thinking approach can assist in the development and implementation of an information strategy’s procedures and also in their subsequent evaluation.

9.6.2 Critical Systems Thinking as Applied within the Case Study and the Development of Revised Framework 2

Based on the Case Study research, Figure 8.1 has been amended to give Figure 9.5. In this evaluative framework the elements within the ‘control structures’ have been split into two parts, so that the top left side of Figure 9.5 now contains only aspects that relate to the ‘Generation’ of an HEI’s information strategy; and the top right side those aspects that relate to the ‘Evaluation’ of the strategy. At the left and bottom of the diagram remain the information strategy elements from Figure 8.1 that deal with the HEI’s external and internal environments, and which therefore need consideration when the strategy is being developed, as well as when it is being evaluated.

As in the initial framework of Chapter 4 (Figure 4.7), the ‘Critical Systems Thinking’ box is also part of this new framework, but the highlighted areas are slightly different. Here the evaluator is asked to look at the information strategy that is in place, and decide which elements (if any) have been problematic. Where such an element is identified, the harder but important question is to identify why the problems have occurred, and in CST terms to ask what methodology might be most appropriate for correcting the situation.

In choosing such a methodology, the social theory and methodological issues discussed in Chapter 2 would be expected to come into play. To illustrate how the evaluator might pursue this type of CST approach, three simple examples can be given:

(1) The evaluator may recognise that part of the strategy is failing because no one is taking ‘ownership’, either of some information or of the system that handles this. In this case the Soft Systems Methodology pioneered by Checkland and others (see Section 2.4.3) for engendering a cohesive view of both problem and solution might be the most appropriate methodology to apply.
**CRITICAL SYSTEMS THINKING IDEAS EMBEDDED IN THE FRAMEWORK ELEMENTS**

<table>
<thead>
<tr>
<th>Critical Awareness</th>
<th>Understand people’s perceptions.</th>
<th>Observation, interview, discussion, AR, case study, etc.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Understand limitations of inquiry methods.</td>
<td>Identify boundary conditions. Ask is and ought questions.</td>
</tr>
<tr>
<td>Parallelism</td>
<td>Types of knowledge: - technical, - practical, - emancipatory</td>
<td>Empirical-analytic inquiry, Historical hermeneutic inquiry (see below)</td>
</tr>
<tr>
<td></td>
<td>Use of multiple social theories</td>
<td>B &amp; M’s paradigms, critical social theories, organisational theory</td>
</tr>
<tr>
<td></td>
<td>Use of appropriate intervention methodologies.</td>
<td>E.g. SSM, SoSM, TSI, CSH, methodology selection frameworks</td>
</tr>
<tr>
<td>Emancipation</td>
<td>Who has the power? Is this deciding the truth?</td>
<td>Critique of ideology, assumption analysis, needs radical change</td>
</tr>
</tbody>
</table>

**Figure 9.5 Revised Evaluative Framework 2 - Informed from the Case Study**

(Note: Topics discussed and methods used in the present chapter are highlighted.)

**HEI’S INFORMATION STRATEGY**

- **Information Creators and Users**
  - Management
  - Academic & other Staff
  - Students
  - External bodies

- **Information Systems**
  - Information Technologies
  - Systems
  - IS staff

- **Organizational Structure**
- **Organizational Culture**
- **Resource Management**
- **Information Needs Analysis**

- **External environment analysis**
- **Competitive advantage**

- **Internal environment analysis**

**GENERATION**
- Preparing
- Planning
- Developing
- Implementing

**Control Structures**

**EVALUATION**
- Monitoring
- Major Reviewing
- Evaluative structures

Managing strategic change
- Strategic alignment
- Information needs analysis
(2) As another example, perhaps a strategy has failed because of 'lack of resources'. But in reality this begs the wider question: Why was the strategy development undertaken with inadequate resources – was it too few resources; too great an ambition; or just a lack of understanding of what resources would be needed? In each case, there is likely to be an underlying reason that needs to be clarified by reflection, investigation and discussion, if the problem is to be properly resolved.

(3) As a final example, the evaluator may find evidence of hierarchy or coercion that has impeded the effective implementation. Methods exist in the literature for thinking about such coercive situations. These need to be reviewed and the most appropriate brought into play.

However, while we are dealing with each of the information strategy elements we also need to think about the whole organisation in a 'creative' and 'holistic' way, rather than just focusing on parts of it. As Jackson (2003) stressed, we need to take account of interaction and not 'pander to the concept that there is one best solution in all circumstances'.

In choosing a methodology within the context of an information strategy evaluation, the evaluator may want to consult a Total Systems Intervention matrix, such as that suggested by Clarke and Lehaney (1996) – a framework for assessing individual methodologies (see Table 2.3 in Chapter 2). This framework allows an evaluator to map the candidate problem-solving methodologies onto a matrix, and the choice of the best methodology is made by deciding which candidate methodology best addresses the issues of creativity, choice and implementation (the three phases of TSI) when mapped against the three cognitive interests proposed by Habermas' (namely, technical, practical and emancipatory).

9.7 Summary and Conclusions

The University of Hull was one of the six JISC pilot sites, and appeared overall to be very successful in its implementation of an information strategy. This university followed JISC's Guidelines, gave a high level of commitment to
the process, and allocated a reasonable level of resources. Unlike most other HEIs, this university maintained a senior committee with responsibility for implementing and monitoring the information strategy. This committee received regular reports from its project teams, including an annual report on corporate systems development and the Development Plan.

An important decision was taken to devolve responsibility for information quality away from the centre, passing this to the departments and individuals. This improved information quality, and in ‘soft-system’ terms ‘closed the human loop’ by giving people ownership of information and a sense of partnership in the information provision process across the university.

Considerable effort was expended in bringing staff ‘on-board’ with the information strategy development process. This effort was large but so were the benefits. These not only reflected on the information strategy process, but also translated across to improving management expertise within the general university functions.

Many interesting specific issues emerged from the implementation of the information strategy at the University of Hull. These included: restricted access versus shared ownership and responsibility; the move from paper reports to electronic display; reduction in data duplication; value-for-money gains; improvement in information quality; the use of ‘quick win’ approaches; recommending ‘experienced users’ as a resource; and cases for breaking the rules on non-duplication data.

However, while it was clear that the University of Hull had found benefits from the implementation of their information strategy, they had not yet put in place a full range of monitoring and reviewing procedures. Given the ‘human-centred’ nature of the information strategy process, it is felt justified to suggest that such monitoring procedures should include an element of ‘critical system thinking’ in the development and implementation of such procedures.

The outcome of the case study is the final framework for supporting information strategy evaluation – Revised Framework 2 (Figure 9.4), which has split the elements within the ‘control structures’ of the initial evaluative
framework (Figure 4.7 on page 141) into two parts - the ‘Generation’ aspects of an HEIs information strategy; and the ‘Evaluation’ aspects of the strategy.

Overall, the empirical findings described in this chapter have supported the general notion that the reflective ideas and the methodological choices proposed by critical systems thinking can assist in information strategy evaluation at UK HEIs.
PART IV

SUMMARY AND CONCLUSIONS
CHAPTER 10

SUMMARY, CONCLUSIONS AND FURTHER RESEARCH
10.1 Introduction

This is the last chapter of the thesis. It gives an overall summary and conclusions of the thesis including an outline of key findings from both the literature and the empirical research, and presentation of the final evaluative framework and guidelines for its implementation. This is followed by an outline of the main contributions of the research, limitations of the research and suggestions for further study.

10.2 Summary and Conclusions of the Thesis

10.2.1 Overall Summary

This thesis was primarily concerned with understanding the development processes for the implementation of information strategies in HEIs, and with the formulation of a framework for the evaluation of such strategies. This thesis is composed of four parts within which there are ten chapters. The basic structure is given in Figure 10.1.

Chapter 1 presented the aims and specific objectives of the research. Chapter 2 covered the theoretical literature seen as relevant to this thesis. It started with a rationale for the choice of literature, which concluded that the philosophical and theoretical view of this study is that the world is socially constructed, and that human issues need to be understood from such a viewpoint. The social theories of Habermas, Foucault and Kant were presented as these are recognised as the
theoretical base for the development of Critical Systems Thinking (CST) which informs the empirical research of this thesis.

Figure 10.1 Overview of the Thesis

The chapter then reviewed key information systems development methodologies. This included the development from 'hard' to 'soft' approaches, the introduction of systems thinking ideas, and a particular emphasis on the recent
developments of Critical Systems Thinking. The theoretical assumptions and philosophical groundings of these approaches were explored, and the strengths and limitations of the methods compared. This helped set the direction of this research which encompasses philosophical, methodological and theoretical pluralism.

In contrast to these social-theoretic aspects, Chapter 2 also reviewed the more practical perspectives of an information strategy which are informed from existing organisation and management theories, as these relate to additional elements that need consideration when developing and implementing an information strategy.

In Chapter 3, the main focus was to review the empirical literature dealing with the practice of information strategy development in UK HEIs, although the chapter also covered views from the theoretical literature that concern an organisation's strategy. Chapter 4 described the development of an initial framework to support the evaluation of information strategies at HEIs (see Figure 4.7). The framework was built in four stages and is directly based on both the theoretical and empirical literature reviewed in Chapters 2 and 3. The framework breaks an information strategy down into a variety of basic elements, with these being classified under the major headings of 'control structures', 'external environment', and 'internal environment'. For each element, the framework refers a potential evaluator back to the appropriate theoretical and empirical literature. The framework also gives practical pointers as to how an evaluation can be carried out.

Chapter 5 presented the research methodology designed for this thesis. For the empirical research of this study, four pieces of research were chosen – action research, two pieces of ethnographic research and a case study. Maxwell's model of qualitative research was used for the design of each investigation, and Huberman’s interactive model was used for the data analysis. In addition, Denzin's idea of triangulation was adopted to improve the validity of the research results.
The four pieces of empirical research are each described in a separate chapter. Chapter 6 describes the investigation using action research of a Student Records System at a UK university. This provided an operational background to the research of this thesis, and allowed the researcher to gain a deeper understanding of some of the specific processes related to the operation of an information system and to information strategy development. The investigation included the researcher's experience of working within the system, where this included interacting with the users, data-inputters, and managers associated with the system. In addition, the research included carrying out a number of semi-structured interviews and a range of more general conversations in order to elicit more detailed information about users' views of the system.

Chapter 7 concerned the researcher's participation in the process of an institution's information strategy development and used an ethnographic research approach. This consisted of the researcher's participation in, and observation of, the decision-making process connected with the strategy development. A range of interviews and discussions were also conducted here to provide a deeper and broader view of the information management process within the research university.

Chapter 8 was concerned with the researcher's participative observation at a sequence of JISC workshops and conferences on information strategy development at HEIs. In addition to participating in these workshops and conferences, interviews and discussions were conducted with selected participants at these meetings. This investigation expanded the previous empirical research to include a wider range of UK HEIs, and widened considerably the researcher's understanding of the information strategy processes across a range of UK HEIs. The data from this piece of research was triangulated with the first two research investigations already undertaken, with the aim of validating the research findings and adding insight to the information strategy evaluative framework.

Chapter 9 was a case study. This was concerned with the in-depth investigation of the development and implementation of an information strategy at another UK university. The main methods used were document review and semi-
structured interviews, and the purpose was to identify and analyse key factors that accounted for the success or failure of aspects of the information strategy already in place. The case study also provided a further opportunity to use Critical Systems Thinking ideas to reflect on and to revise the evaluative framework for information strategies set out in Chapter 4.

The next two sections summarise key findings from both the literature review and the empirical research.

10.2.2 Key Findings from Theoretical and Empirical Literature

A. Theoretical and Philosophical Direction of this Research

The review of the relevant theoretical literature showed that the world in which this study is placed should be viewed as socially constructed, in the sense that human issues can only be understood properly from a social viewpoint. The theoretical literature also emphasised the need to uncover people’s perceptions of any given problem situation, rather than considering the situation as having ‘objective reality’.

The literature review highlighted in particular the works of Habermas, Foucault and Kant as forming a suitable basis for understanding the social world in which the research within this project was carried out. The implication of Habermas’ three cognitive interests is that the methods for any human-centred research investigation should be pluralist in their social-theoretic viewpoint, and pluralist also in the research methodologies selected. This is because Habermas’ views recognise the need to examine the different types of human interests, including specifically the issues of emancipation, when seeking systems solutions to real-world problems. To Foucault, emancipation is a stronger concept than to Habermas. It does not simply mean having scope within an organization to realise each organization member’s own potential, but also implies a need to understand where power lies and how it is exercised, including potentially the need to remove the power from the powerful. In addition, Kant laid the theoretical grounds for the various social theorists, including Habermas and Foucault, by insisting that people
can only know the world through their perceptions. Thus, in Kant’s view, people *only* know by what they see, hear, taste, touch and smell; and by what they think in response to these stimuli. Understanding a situation fully and being able to take appropriate action within that situation, therefore, implies a need to properly understand people’s perceptions of the situation.

Combining the views of the above critical thinkers implies that to seek for solutions to problems which involve people, we must use a variety of inquiry procedures that correctly uncover people’s perceptions and the reasons for their particular behaviour, and then to employ intervention methodologies that also take due account of these perceptions, viewpoints and motivations. The latter needs specifically to recognise that issues associated with emancipation, power and coercion may need to be addressed.

**B. Information Systems Development Methodologies**

The findings from the review in the theoretical literature of the key approaches in the development of information systems can be summarised as follows.

1. ‘Hard’ systems approaches are still popular for many types of decision-making, and in particular are judged appropriate for well-defined technical problems. But they have often been found to be unable to deal effectively with complicated ill-structured situations characterised by the involvement of human beings within the system.

2. ‘Soft’ systems thinking by contrast was developed specifically to deal with people within the system, and to take account of their perceptions, values, and interests. This approach has many advantages over hard systems thinking, but is criticised in turn for being unable to help practitioners address the problems of coercion, or of combining multiple methods within a single intervention.

3. Critical Systems Thinking (CST) is an approach that is based on critical social theories, and which has been developed from critiques of ‘hard’ and ‘soft’ systems thinking. It accepts the place of both approaches, but also
emphasizes the ‘oppressing and inequitable’ nature of many social systems. Three examples of CST were given:

(a) Critical Systems Heuristics (CSH). This studies existing systems by asking boundary questions - ‘is’ or ‘ought’ questions to discover whose interests the systems serve, where this goes some way to questioning power. The approach has been criticised for having no formal procedures for examining and overcoming underlying political and economic forces.

(b) System of Systems Methodologies (SOSM). This is an example of CST which provides a unified approach, by drawing on the strengths of the relevant methodologies, and allows their complementary and informed use in dealing with a problem situation. However the approach pays little attention to how to co-ordinate different methodologies in the same intervention.

(c) Total Systems Intervention (TSI), as a third example of CST, is also based on complementarist ideas. It is seen as a ‘meta-methodology’ seeking to operationalise pluralism in a seemingly varied and changeful social world. But it has not been widely applied in practice perhaps partly because it calls for high levels of competence from its practitioners.

As it was found historically that overall neither a hard, nor a soft, nor a critical approach could fully capture the richness of real-world situations, critical pluralism became to be seen as the way forward in systems thinking. It was noted also that in many disciplines, including that of information systems, the acceptance of paradigm isolation began to break down. Generally, in the last decade or so, the systems debate has turned to various forms of pluralism in both methodological and philosophical terms.

C. Management Theories

Separate from the above social systems literature, rather more practical information related to implementing and evaluating an information strategy can be
drawn from the literature on management theory. Key ideas taken from this literature included the need to understand an organisation's structure and culture, and general concepts connected with the analysis of internal and external environments, resources allocation, strategy management, and management of strategic changes.

**D. The Practice of Information Strategy Development in UK HEIs**

Chapter 3 reviewed the empirical literature on the practice of information strategy development in UK HEIs. This showed that the publication of the *Guidelines* for Information Strategy Development by the Joint Information Systems Committee had generated much interest within UK HEIs, and that they had guided the pilot sites' progress in general terms. Additionally, changes were later suggested which were included in the revised *Guidelines*. Importantly, however, both versions of the *Guidelines* were found to be strongly slanted towards a 'planning' approach to information strategy development rather than inclusive or emergent approaches. This supported the view that critiquing information strategy development from a social viewpoint might yield valuable findings. The review of the strategy implementation in HEIs also revealed that liaison had not continued between JISC and the pilot sites, and that little had been done to assist in the monitoring and the evaluation of the information strategies once in place.

By way of a summary, Figure 10.2 outlines some of the systems methodologies, selection frameworks and analysis techniques that have been looked at in this research.
### Information Strategy Elements

| Preparing, planning, developing and implementing |
| Monitoring and reviewing |
| Organisational structure and culture |
| Resource management |
| Information needs analysis |
| Strategic alignment |
| Managing strategic change |
| Evaluative structures |
| External environment |
| Competitive advantage |

### ‘Tool Kit’

#### IS Methodologies
- System Dynamics
- Viable System Diagnosis;
- Strategic Assumption
- Surfacing and Testing
- Interactive Planning
- Soft Systems Methodology
- Critical Systems Heuristics
- System of Systems Methodologies
- Total Systems Intervention

#### Selection of Frameworks
- Strategic Choices (Johnson and Scholes)
- Information Systems Strategic Management (Clarke)

#### Analysis Techniques
- Four paradigms (Burrell and Morgan)
- Three interests (Habermas)
- SWOT & PEST analysis
- Skin of onion (Campbell)
- Culture web (Johnson)
- Value chain & five forces
- Strategic alignment (Henderson)

#### Other Tools
- JISC Guidelines
- Experiences of Pilot and Exemplar sites and other HEIs

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*Figure 10.2 Choice of Methodologies for Information Strategy Elements*
10.2.3 Key Findings from the Empirical Research

A. Introduction

As mentioned earlier, each piece of empirical research provided an opportunity to use the initial evaluative framework of Chapter 4 (Figure 4.7) to reflect on the findings from the investigation. In turn each investigation was designed to add practical insights into the relevant elements of the framework. Table 10.1 gives an outline of the investigations and highlights the research foci in each case. The main findings from these investigations are presented in the following subsections.

Table 10.1 Overview of the Empirical Investigations

<table>
<thead>
<tr>
<th>The Investigation</th>
<th>Main Objectives</th>
<th>Research Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investigating problems with a Student Records System</td>
<td>Identify problems, analyse causes and suggest solutions for improvement; provide background for this research.</td>
<td>Action Research</td>
</tr>
<tr>
<td>Participating in the development of an information strategy</td>
<td>Identify key issues relevant to information strategy development and consider paths to such strategy implementation.</td>
<td>Ethnography</td>
</tr>
<tr>
<td>Attending workshops and conferences on information strategy</td>
<td>Explore experts' ideas on information strategy development and expand issues already identified in this research.</td>
<td>Ethnography</td>
</tr>
<tr>
<td>Investigating the implementation of an information strategy</td>
<td>Identify key factors accounting for the success of an information strategy implementation; confirm and validate the evaluative framework</td>
<td>Case Study</td>
</tr>
</tbody>
</table>

B. Action Research - The Investigation of the Student Record System

The action research investigation of the university’s Student Records System (SRS) revealed many findings. While some of these were related to the daily operations of the system, others were more strategic and connected with the general information environment of the university. The main findings were as follows:
(1) The SRS exhibited a range of significant failings, including incorrect, incomplete, and unsatisfactory information; a failure to provide information to key academic activities; and a failure to record core data for official returns. The situation was so serious that some system users said the problems had caused a 'disaster' to the university.

(2) Key immediate causes for the problems were identified as lack of system specification, poor data quality, poor system management, inflexibility within the system, and lack of communication about the system.

(3) Investigation indicated that deeper factors were also at work. Many people had realised that the problems concerning the SRS were serious, but there was no agreement on the underlying causes for these problems, and there seemed subconsciously to be a culture of blame. The SRS was thus typical of many failed information systems: agreement with the system's aims, but dissatisfaction with its reality; confusion and blame about what was wrong, little attention to users' needs, and poor motivation of many of those involved.

(4) To address these deeper problems, it was proposed that the evaluative framework of Chapter 4 could be of assistance. Specific aspects of the SRS could be tied back to elements listed in the framework and the corresponding analytic approaches and system methodologies be used to tackle the problems in a holistic way. In particular, these elements included information needs analysis, evaluative structures, managing strategic change and organisational culture. These aspects are amplified below:

(a) The information needs analysis for the SRS was poorly done or out of date. Key information was missing, and the information available often unreliable. A comprehensive information needs analysis was required, where the relevant section of Chapter 4's evaluative framework indicates various methodologies that can be used.

(b) The 'evaluative structures' for the SRS were inadequate as the SRS failures had become chronic, and for a long time had not been picked up and addressed in any systematic way.
(c) Another area where well-established approaches were not being employed was that of strategic change. Quite often changes to the SRS were being introduced without adequate parallel running; and on the human front change was being implemented without adequate discussion or provision of staff training.

(d) The organizational culture associated with the SRS clearly needed change. Though people experienced the system problems on a daily basis, they were not motivated to get them addressed. It was suggested that the SRS was 'a system where operational issues took priority over strategic issues'.

(5) In terms of such problems, the investigation of the SRS suggested the need for a more critical focus in the methods of problem resolutions, ensuring openness in response to questions, and finding ways to encourage people affected by the problems to consider more complex 'social theoretic' issues such as motivation, information ownership, hierarchy and power.

(6) In terms of hierarchy, it was significant that interviews on the SRS revealed two distinct sets of comments. Respondents with a responsibility for the system tended to speak highly of the system, while most ordinary system users had various complaints about it. Therefore, to draw a rich picture of the system, the researcher attempted to put herself into the shoes of the respondents, to try to understand their backgrounds and think about the real motivations for their responses to the questions asked.

(7) Where decisions about the SRS were being taken, these were often dictated from the top, with little attempt made to allow for 'emergent' strategy formation. This pointed to a need to employ Critical Systems Thinking ideas (including well-defined 'soft' methods like SSM) in order to develop a suitably 'rich picture' of the overall situation, and to utilize methods likely to achieve understanding, perhaps even consensus among all those connected with the issues.

(8) In terms of the research methods employed, the 'action research' nature of the investigation was very helpful. By participating in, and helping to change the situation, the researcher found it easier to understand why the various 'actors'
involved with the SRS behaved and felt as they did. In particular, the large number of semi-structured interviews carried out, and the subsequent analysis, proved useful methods for uncovering people’s deeper attitudes to the situation in which they found themselves.

C. Ethnography I - The Participation in an Information Strategy Development

The main findings from the researcher’s participation in the information strategy development included:

(1) An information strategy at this university was considered to be ‘a good thing’ but there was uncertainty over what an information strategy is, what it should consist of and how it might be formulated. Some of the people involved in the strategy development insisted on developing the strategy in a prescribed format; others suggested carrying out this process as a participative exercise. In the event, the process undertaken at the university was very much ‘top-down’ and directed, despite attempts made to introduce Critical Systems Thinking ideas, which could have offered a more holistic methodology to embrace various perspectives and different approaches.

(2) At the Information Strategy Steering Group meetings, there was evidence of coercion and unbalanced decision-making. It was noticed when there was a disagreement on a decision, the actual process undertaken was very much ‘top-down’, in that the views of more junior members of committees (and often the more technically knowledgeable) were discounted. An attempt to introduce CST ideas into the development process was also over-ruled. The evaluative framework of Chapter 4 draws attention to some of the social theories that address these issues (see Section 2.3 in Chapter 2). Though these theories do not lead necessarily to direct solutions, they do provide insight into human behaviour and attitudes to allow the situations to be reflected upon and addressed.

(3) In terms of implementing the information strategy, the evaluation framework gives detailed aspects to be considered within the implementation process. These were discussed in Section 7.7 above under the ‘control structures’ headings of preparing, planning, developing, implementing and monitoring and
reviewing; and under the ‘external environment’ and ‘competitive advantage’ headings. Some of the main insights gained from aspect of Ethnography I were:

(a) In terms of preparing the information strategy, the researcher’s experience confirmed that it was difficult for the university to form a strategic view on the information strategy development from the outset.

(b) In terms of planning the information strategy, an important aspect was the issue of dissemination and access to information. Information is of little use without access, and the research showed that at this university in this regard there was a lot of room for improvement.

(c) For developing an effective information strategy, one of the most important things is to define the scope of information in order to understand the information needs of the university, and the way information flows within the organization. In this university, partly because of the other responsibilities of the Information Strategy Co-ordinator, the time allocated to the formulation of the information strategy itself was limited. Moreover, as the main part of the university’s information strategy process, the SRS was the only system investigated, with most people involved in the investigation process being senior management staff, mostly administrators. There were not enough academic and other users of the SRS involved in the process of generating the information strategy so that the focus appeared to be too narrow to generate a full picture of the information needs of the university. In addition, it seemed that inadequate attention was being paid to issues of communication and information sharing across the university.

(d) In terms of monitoring the information strategy once it is place, one important aspect is the issue of the ownership of information. It should be clear who owns each piece of information, who is responsible for maintaining and updating it, who has the right to alter it and who is permitted to access it. It was suggested that key information (such as that required for Subject Review) be managed by a statistician whose responsibility is to provide basic data sets and an information service. Mechanisms were also required for monitoring the quality of
information provided centrally, for identifying and correcting inadequacies in information and processes, and for facilitating feedback from users to providers.

(e) The ISSG meetings at the university did not have explicit discussions on the external environment of competitive advantage, and the information strategy document did not include these. However, to develop and implement an effective information strategy for the university, important factors related to both 'external environment' and 'competitive advantage' cannot be ignored, since they can have significant impacts on the future of the university. It will help the formulation of an information strategy if the likely impacts of such factors are considered rationally.

(4) Many of the issues identified within Ethnography I mirrored those raised in the action research. However in Ethnography I these were raised at a higher level (within the ISSG), and were set against discussion about formulating an information strategy for the university.

(5) Additionally it was noted that a key requirement of an information strategy was for the information users to understand the importance of information. It was clear that the moves towards a strategy so far had not fully addressed this issue of getting a sufficiently widespread acceptance of the importance of this concept for the proper functioning of the institution.

(6) As a final observation from Ethnography I, it was felt that the university should aim to move away from a 'blame culture' regarding its information management and seek to empower people with wider responsibilities in order to successfully implement its information strategy.

D. Ethnography II - Participant Observation at Workshops and Conferences on Information Strategy

The researcher’s participant observation at JISC workshops and conferences and the additional interaction with other participants outside these meetings gave a much wider view of issues connected with information strategies at UK HEIs. The range of topics discussed covered all stages of information strategy development. The main findings included:
(1) At these meetings there was considerable, though not universal, support for the general notion of the benefits from information strategy development. But there was also confusion over what an information strategy was, how it should be generated, and whether it would have a significant impact the university's information management.

(2) A key point that emerged from these meetings - already apparent in the early JISC documents - was the lack of theoretical underpinning to the development and implementation processes suggested for such information strategies. In the case of JISC Guidelines a fairly standard 'mechanistic' approach to strategy development had been proposed at the outset, and was reflected in many of the discussions at the workshops. The case for this should not be overstated, as JISC suggested holding focus-groups meetings and using questionnaires across an HEI to elicit ideas, perceptions, grievances and expectations about a proposed information strategy. But the bulk of JISC documentation and the subsequent discussions centred on mostly top-down, prescriptive approaches to the development and implementation of information strategies. This finding highlighted the importance of the links within the evaluation framework proposed here (Chapter 4) and the underlying theory.

(3) There was an apparent 'emancipation' issue, in that some delegates felt they were being 'sent to these meetings' without their personal sympathy with, or support for, the process being discussed. Such power-structure issues would need addressing, referring back to the ideas of Foucault, if an agreed 'truth' about the strategy development process were to emerge within their organisation.

(4) There appeared to be a need for more solid proposals as well as experience concerning information strategy monitoring and follow-up procedures.

The outcome of Ethnography II was the generation of the Revised Framework 1 (Figure 8.1) for information strategy evaluation. This Framework now has explicitly at its centre the HEIs 'Information Strategy', as implemented. Within this strategy there are two main sections: the bodies within or associated with the HEI that use the information covered by the strategy and where these bodies frequently also generate this information; and the institution's information
systems. This latter section contains the institution’s information, the wide variety of technologies, systems that handle this information, and the staff directly employed in running these systems. The reason for making this change was that this researcher’s experience at the JISC workshops and conferences suggested that an information strategy at a HEI should be seen as a process rather than an outcome. This process starts with the three main areas identified in the Framework of Figure 4.7 - control structures, external environment and internal environment, where these are sub-divided into the elements as listed in the framework. Then, as discussed in previous sections, critical systems thinking procedures need to be brought to bear on these elements when evaluating the information strategy as actually developed. In the case of the ‘control structures’ the critical awareness ideas of human-centred inquiry, emancipation and appropriate choice are required. In the case of the ‘external environment’ and ‘internal environment’, social awareness and appropriate choice are required for the analysis methodologies. The underlying idea is that as an information strategy is evaluated, critical systems thinking concepts should formally be incorporated into the process.

E. Case Study – The investigation of an Information Strategy Implementation

As one of JISC’s pilot sites for information strategy development, the University of Hull was considered to have been very successful in the development and implementation of its information strategy. The case study investigation at this university provided a useful opportunity to look in more detail at the development and the implementation processes of its information strategy.

From the perspective of this researcher the main factors that accounted for the successful implementation of the University of Hull’s information strategy appeared to be:

(1) The university not only followed the JISC’s Guidelines, but also gave a high level of commitment to the process, and allocated a reasonable level of resources.

(2) As one of its information management principles, the university maintained a senior committee with responsibility for implementing and
monitoring the information strategy. This committee, known as the Information and Communication Committee, received regular reports from its project teams including an annual report on the corporate systems development and the development plan.

(3) Importantly, a decision was taken to devolve responsibility for information quality away from the centre, passing this responsibility out to departments and individuals. This not only improved information quality, but in ‘soft-system’ terms ‘closed the human loop’ by giving people ownership of information and also a professional sense of partnership with the information provision process across the university.

(4) Early success in implementing the information strategy was helped by the identification of numerous ‘quick win’ opportunities, many of which involved only minor procedural changes, and did not require change to existing computer systems.

(5) Quantifiable benefits at this university had been found from the strategy, both in improving data accuracy submitted for statutory returns, and in terms of reduction of staff and scope for their re-deployment.

(6) Other issues that emerged from the implementation of the information strategy at the University of Hull included restricted access versus shared ownership and responsibility; the move from paper reports to electronic display; reduction in data duplication; value-for-money gains; improvement in information quality; recommending ‘experienced users’ as a resource; and cases for breaking the rules on non-duplication data.

(7) Though there was no recourse to specific social theory, considerable effort was expended in bringing staff ‘on-board’ with the information strategy development process getting people to accept, understand, and take responsibility for the information strategy, both in its development and its operation. It was recognised that this effort was large, but that so were the benefits, and that these not only reflected on the information strategy process, but also translated across to improving management expertise within the general university functions.
The above were all important lessons, and in terms of applying the evaluative framework of Chapter 4, they bear directly on many of the aspects covered in the empirical research investigations reported earlier in Chapters 6 to 8, including organisational culture and structure, resource management, information needs analysis, and management of strategic change.

The university, with a successful information strategy in place, also gave the opportunity to look at the framework’s ‘evaluative’ elements of monitoring, reviewing and evaluative structures. Here the process seems to need further work. Like JISC’s wider attempts at information strategy evaluation, the university found this was not a simple issue. When information was available on the quality of data (for statutory returns) this had improved. But in terms of monitoring of people’s general satisfaction with the data and the systems, and at a somewhat deeper level, of monitoring data providers’ and users’ understanding and involvement in the aims and philosophy of the information strategy process, it is probable that such monitoring procedures should include an element of ‘critical system thinking’ in their development and evaluation. For this reason, the evaluative framework of Chapter 4 (as revised in Chapter 9) puts such monitoring on a more formal and theoretically grounded basis.

In this revised framework the elements within ‘control structures’ were split into two parts, so that one part relates to the ‘generation’ of an HEI’s information strategy; and the other ‘evaluation’. Also the highlighted areas in the ‘Critical Systems Thinking’ box are slightly different. The evaluator is asked to look at the information strategy that is in place, and decide which elements if any are problematic. Where such an element is identified, the important question is to identify why the problems have occurred, and in CST terms to ask what inquiry methods and solution methodologies might be most appropriate for uncovering and correcting the situation. In choosing these the social theory and methodological issues discussed in Chapter 2 would come into play. Three examples to illustrate this were given in Chapter 9, and in choosing such a methodology the evaluator may want to consult a Total Systems Intervention matrix, such as that suggested by Clarke and Lehaney (1996). This allows an
evaluator to map the candidate problem-solving methodologies onto the matrix, and then decide which methodology best addresses the issues of creativity, choice and implementation (the three phases of TSI) when set against the three cognitive interests proposed by Habermas, i.e. technical, practical and emancipatory.

10.3 The Final Evaluative Framework

10.3.1. The Final Evaluative Framework

The final evaluative framework of the thesis is re-presented here as Figure 10.3. The main difference of this final framework from those presented in Chapters 6 to 9 is the removal of those 'highlights' on specific elements as addressed by different pieces of empirical research.

Table 10.2 is an update of Table 4.6, but with additional references to the findings from the empirical research of Chapters 6 to 9. This table shows the main theoretical perspectives and empirical evidence that can be used to support each of the framework elements of Figure 10.3. It is intended to help an evaluator more easily identify and access these relevant theoretical aspects and empirical evidence when he/she evaluates an information strategy as implemented at a HEI.
CRITICAL SYSTEMS THINKING IDEAS EMBEDDED IN THE FRAMEWORK ELEMENTS

<table>
<thead>
<tr>
<th>Critical Awareness</th>
<th>Understand people’s perceptions.</th>
<th>Observation, interview, discussion, AR, case study, etc.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Understand limitations of inquiry methods.</td>
<td>Identify boundary conditions. Ask is and ought questions.</td>
</tr>
<tr>
<td>Pluralism</td>
<td>Types of knowledge: - technical, - practical, - emancipatory</td>
<td>Empirical-analytic inquiry, Historical hermeneutic inquiry (see below)</td>
</tr>
<tr>
<td></td>
<td>Use of multiple social theories</td>
<td>B &amp; M’s paradigms, critical social theories, organisational theory.</td>
</tr>
<tr>
<td></td>
<td>Use of appropriate intervention methodologies.</td>
<td>E.g. SSM, SoSM, TSI, CSH, methodology selection frameworks.</td>
</tr>
<tr>
<td>Emancipation</td>
<td>Who has the power? Is this deciding the truth?</td>
<td>Critique of ideology, assumption analysis; needs radical change.</td>
</tr>
</tbody>
</table>

**Figure 10.3: Final Evaluative Framework for Information Strategies of HEIs to be used with Table 10.2 and Figures 10.4.**

**HEI’S INFORMATION STRATEGY**

- **External environment analysis**
  - Competitive advantage
  - Organizational structure
  - Organizational culture
  - Resource management

- **Internal environment analysis**
  - Information Creators and Users
    - Management
    - Academic & other Staff
    - Students
    - External Constituencies
  - Information Systems
    - Information Technologies
    - Systems
    - IS staff

**GENERATION**
- Preparing
- Planning
- Developing
- Implementing

**Control Structures**

**EVALUATION**
- Monitoring
- Major Reviewing
- Evaluative structures
- Managing strategic change
- Strategic alignment
- Information needs analysis
### Table 10.2 Key Theoretical Perspectives and Empirical Evidence of the Framework Elements of Figure 10.3

<table>
<thead>
<tr>
<th>Framework Element</th>
<th>Theoretical Perspectives</th>
<th>Empirical Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CONTROL STRUCTURES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prepare, plan, develop, implement, monitor, and review</td>
<td>Strategic planning (Gallier, 1991); Planned and incremental strategies (Mintzberg, 1987; Quinn, 1980); 'Is' and 'ought' (Ulrich, 1983); SoSM (Jackson and Keys, 1984); Jackson, 1987b); TSI (Flood and Jackson, 1991b); Strategic implementation (Johnson and Scholes 1993); Mixing Methods (Clarke, 2001b)</td>
<td>Clear description in the Guidelines (JISC, 1998); Lessons to learn from the experiences of JISC pilot sites; of the University of Luton and the University of Hull</td>
</tr>
<tr>
<td><strong>EXTERNAL ENVIRONMENT</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environment analysis</td>
<td>Five forces (Porter 1990); Survey of the environment (Johnson and Scholes 1993); Environment analysis (Campbell et a; 1999); PEST model, SWOT analysis</td>
<td>Internal and external environments are important. (JISC, 1998b); the empirical research of this thesis supported this.</td>
</tr>
<tr>
<td>Competitive advantage</td>
<td>Five forces (Porter 1980); The strategic advantage to be gained from information (Porter 1990)</td>
<td>Action research showed that ignoring this had put the university in a less competitive position.</td>
</tr>
<tr>
<td><strong>INTERNAL ENVIRONMENT</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organisational structure</td>
<td>Four views (Jackson, 1987a); Basic organisational structures (Johnson and Scholes, 1993); Mechanistic to adhocratic (Mintzberg et al. 1998); Mataphors (Morgan, 1986); Four paradigms (Burrell and Morgan, 1979)</td>
<td>The University of Hull’s experience showed that a changed organisational structure in correspondence to the changed environments had facilitated its information strategy implementation.</td>
</tr>
<tr>
<td>Organisational culture</td>
<td>Four paradigms (Burrell and Morgan, 1979); Cultural web (Johnson and Scholes, 1993); General discussions on organisational culture (Pettigrew, 1987; White, 1984; Schein, 1996, Wit and Meyer, 1999).</td>
<td>JISC’s pilot sites’ experience implied there was a need to move to more inclusive and participative culture (JISC, 1998b). The action research site had a ‘cost’ for its ‘blame’ culture.</td>
</tr>
<tr>
<td>Resources management</td>
<td>IT and information – different resources (King, 1988); TSI (Flood and Jackson, 1991b); Resource planning (Johnson and Scholes, 1993); Information systems (Avison and Fitzgerald, 1995); IS functions (Savage and Mingers, 1996); Resource analysis framework (Campbell et al., 1999)</td>
<td>The implementation of an information strategy is found to be resource constrained. Some HEIs considered reduction of resources as one of the reasons for having an information strategy. This research showed there should be a balance between the two.</td>
</tr>
<tr>
<td>Information needs analysis</td>
<td>‘What can be known’ (Kant, 1787); Three interests (Habermas, 1972); ‘Interpretative’ paradigm (Burrell and Morgan, 1979); SSM (Checkland, 1981a &amp; b); System movement (Checkland, 1983); ‘Is’ and ‘ought’ (Ulrich, 1983); SoSM (Jackson and Keys, 1984); Management strategies for IT (Earl, 1989); TSI (Flood and Jackson, 1991b); Supply and demand of information (Smits et. al., 1997)</td>
<td>Pilot sites case studies showed that incorporation of ‘user’ views in information needs analysis was weak; JISC had models for this; lessons should be drawn from the action research site.</td>
</tr>
<tr>
<td>Strategic alignment</td>
<td>Align strategies (Earl, 1989); Integrating various strategies (Galliers, 1993); Strategic alignment model (Henderson and Venkatraman, 1993); Linkage between information strategy and business strategy (Smits et. al., 1997)</td>
<td>Alignment of different strategies in JISC pilot sits and other UK HEIs was poorly done; the terms IT, IS and information should not be used interchangeably.</td>
</tr>
<tr>
<td>Managing strategic change</td>
<td>Styles and other issues in change management (Johnson and Scholes 1993); Mechanistic approach (Mintzberg and Westley, 1992); information systems strategic management (Clarke, 2001a)</td>
<td>This was weak in most HEIs, with over-emphasis on operations, lack of long-term vision, and human issues poorly addressed. Lessons should be drawn from negative examples in the thesis.</td>
</tr>
<tr>
<td>Evaluative structures</td>
<td>Strategic choice (Johnson and Scholes, 1993); information systems strategic management (Clarke, 2001a)</td>
<td>JISC’s evaluative structures can be helpful, but there should be monitoring and reviewing mechanism for the overall evaluation.</td>
</tr>
</tbody>
</table>
10.3.2 The Development of the Evaluative Framework

The development of the final evaluative framework took place in two main phases: developing the framework based on the literature review and revising it using the findings from the empirical research investigations, involving a process of critical iteration. The first phase identified a range of elements associated with an HEI’s information strategy. Each element draws the evaluator’s attention to the relevant theoretical or empirical literature that bears on the issues being addressed. In particular, the framework is strongly influenced by insights from the work of three key social theorists: Kant, Habermas and Foucault.

The framework centres around four key inter-related areas of an HEI’s information strategy on which the evaluator needs to focus:

1. The general ‘control structures’ used within the university for preparing, planning, developing, implementing, monitoring, and reviewing the strategy;
2. The degree that the strategy takes account of the university’s ‘external environment’, including its ‘competitive advantage’;
3. The degree that the strategy takes account of aspects of the university’s own ‘internal environment’;
4. The inclusion of CST approaches into the above areas.

Other choices may have been made for the specific framework elements listed under the above three broad categories, but the aim of this research was to select elements that are generic in nature and related to well-defined areas of theoretical and empirical information from which the evaluator can gain insight. In addition, the framework also includes ‘Guidelines for Evaluation’, where these help the evaluator ask practical questions and identify areas to investigate when evaluating a given element of the strategy.

The second phase of framework development took the framework through a series of reflections and revisions using the findings from the empirical investigations. In each case, insights were gained that related to the use or
applicability of the framework. By combining the findings from the theoretical and empirical literature with those from the empirical research, the final framework aims to encompass the complexity of information strategy development and implementation within HEIs. Overall the framework is intended to reflect human-centred and Critical Systems Thinking approaches, with a view to allowing a potential evaluator identify underlying causes for the success or failure of an information strategy that is implemented at an HEI.

The framework has gone through at least three formal revisions. The original version was presented at a conference (Bentley et al., 2002) and was revised in light of comments made at one of the conference workshops. The second revision took account of suggestions from supervisors of this research and was incorporated in a conference paper (Bentley et al., 2004). The third revision has taken place after the thesis viva and has incorporated key feedback from the thesis examiners, aimed at making the CST ideas more explicit within the framework.

10.3.3 The Implementation of the Evaluative Framework

To implement the evaluation framework for information strategies, it was found that a diagram developed and applied in Chapter 9 for the case study research - Figure 9.1 could be adapted for general applications in other HEIs to evaluate their information strategies. This is illustrated here as Figure 10.4.

To evaluate an information strategy, it is suggested that an evaluator put together all the three diagrams – Figures 10.3 and 10.4, and Table 10.2 as a framework set, and use each aspect of the evaluative elements accordingly.
Collect relevant documents

Review the documents

Get an overview of the target university

Find out how the information strategy was generated

Investigate the documented progress for implementing the strategy

Ascertain how the information strategy was developed and implemented

Does implemented strategy follow documented strategy?

No

Yes

Are the mismatches critical?

Are there any major Problems?

Continuous evaluation and revision of the information strategy

Are the mismatches critical?

Yes

Identify areas of mismatches or problems

Identify main causes for mismatches or problems

Continuous evaluation and revision of the information strategy

Make reflections of the findings from the evaluation by referring to the theoretical and empirical implications in the evaluative framework (Table 10.2)

Improve the effectiveness of the Information Strategy

Make a plan for evaluating the information strategy at the university

Carry out the evaluation using a well-designed feasible and effective enquiry methodology

Figure 10.4 A Flow Chart for Implementing the Evaluative Framework for Information Strategies in HEIs (Related to Figure 10.3)
The whole framework set has such functions as:

- Offering advice on how to carry out the evaluation;
- Assisting an evaluator to determine the extent that the information strategy has been successful;
- Pointing to useful theory and empirical experience that can assist the evaluation;
- Providing a useful basis for better informed development of information strategies at HEIs.

In summary, the framework has identified a variety of social theories, management theories, analysis techniques, systems methodologies, methodology selection frameworks, and other tools that can assist in the information strategy evaluation process (see Table 10.2). Note that these approaches are not exclusive, each approach has its strengths and weaknesses and an evaluator has to determine which, when used singly or in combination, best fits the problem situation under review. As Flood and Jackson (1991b, back cover) point out: “In the modern world organizations are faced with innumerable and multifaceted issues which cannot be captured in the minds of a few experts and solved with the aid of some super-method. We need a range of problem solving methodologies”.

10.4 Main Contributions of the Research

10.4.1 Creation of a Theoretically-Based and Empirically-Informed Evaluative Framework for Information Strategies

The creation within this thesis of a framework for information strategy evaluation at higher education institutions (HEIs) drawn from a philosophical and theoretical basis has filled an academic gap in the theoretical research domain. Though many HEIs have developed their institutional information strategies during the past few years, up to now there has been no formal theory-based framework or model to support the monitoring or evaluation of such strategies.
The evaluative framework proposed here is theoretically grounded and empirically informed. It incorporates a wide range of recognised social and systems theories and in particular integrates within its formulation a philosophical line of reasoning based on the findings of Kant, Habermas and Foucault (see Section 2.3). The framework also draws upon empirical information from the experience of JISC and many HEIs, and from the four empirical investigations carried out for the thesis. The framework adopts a holistic perspective to information management within HEIs by taking account of both internal and external environmental factors, and by specifically addressing the various elements of information strategy development and implementation from a Critical Systems Thinking (CST) viewpoint.

The inclusion of CST approaches into the framework focuses the evaluator’s attention onto methods of inquiry, analysis and intervention that incorporate CST’s guiding principles of critical awareness, methodological and theoretical pluralism and emancipation. In particular, the commitment to emancipation allows an HEI to maximise the potential of each individual within the institution involved with the information strategy, and to understand where limits to such potential are set by the organisation’s existing structures of power and coercion.

10.4.2 Application of Accepted Theory within a New Research Domain

As mentioned above and as described in detail in Chapter 4 key ideas of CST have been incorporated into the evaluation framework. Indeed, CST can be seen as an over-arching theme of this work, and not simply as a guide to methodological applications per se. This is because the research indicated the relevance of CST ideas to virtually all the activities investigated within this study. The review of the literature indicated that CST had not previously been explicitly included in information strategy development at HEIs, still less in the evaluation processes for such strategies. Thus, the creation of this evaluation framework with
CST ideas embedded in each of its evaluation elements represents the application of accepted theory to a new research domain.

Additionally, the incorporation of CST ideas into this pluralist programme of research showed that there is no need to abandon elements which CST sometimes finds difficult to address, including 'hard' systems theory, and to some extent the more pragmatic aspects of 'soft' systems theory.

10.4.3 Creation of Links between Theory and Empirical Research in the Research Domain

Within the thesis, four substantial pieces of empirical research have been conducted. Each yielded considerable insight into the practice of information strategy development and implementation at one or more UK HEIs and constituted a contribution to the knowledge base. In combination, the empirical research provided a broad picture of the attitudes, experiences, and methods of UK HEIs in implementing their information strategies.

In terms of the enquiry, methods used throughout the empirical research, participant observation, and interviews were the primary means for qualitative data collection. The main focus of these interviews was based on the Kantian idea of the need to understand people's perceptions of a situation, rather than the situation 'itself'. The interviews aimed at examining the experiences of a wide range of people at the various HEIs relating to the development and implementation of information strategies, and through these investigation processes to identify likely causes and possible solutions to the problems identified.

The inquiries were structured with a view to uncovering the different sorts of 'interests' that people maintain, as exemplified by Habermas' 'constitutive interests'. Habermas showed that it is not enough to find out the simple 'what' of a situation (its technical interest) but that there is also a need to uncover the social interactions involved (practical interests) and the issues to do with self-fulfilment, power and control (emancipation). A range of such social and emancipation issues did indeed come to light, as set out in Section 10.2.2 A.
10.4.4 Key Research Findings

Another contribution from this research lies in its specific findings. Key findings include:

(1) UK higher education institutions have shown an increasing interest in developing institution-wide information strategies over recent years. However, many HEIs in the process of developing an information strategy, or about to do so, were not fully sure how this should be achieved nor the extent of the likely benefits.

(2) Examination of information strategy development in HEIs raised many issues and foremost among these was how 'human factors' can be properly accounted for in such a strategy development. The well-documented failure of many information systems (as opposed to strategies), both within the academic world and more widely, led historically to a range of approaches for information system development which include explicit mechanisms for incorporating human views and interests into the development process. Despite such systems trends, the general approaches for information strategy development as recommended in JISC's documents and as used in HEIs in practice, have in the main followed standard prescriptive system development approaches, leaving little room for more inclusive and emergent planning.

(3) The research within the thesis showed that the successful functioning of an information strategy is dependent on the motivation, competencies and degree of involvement of the people who create and use the information. This endorsed the need for such strategies to be developed using strongly human-centred methods. In particular the research showed that investigations into aspects of information strategy development and implementation need to focus on people's perceptions of a situation rather than seeking an objective truth independent of the participants, thus reflecting a Kantian perspective of knowledge. Overall, the research results suggested the general approach of CST as an appropriate mechanism by which 'human factors' in their broadest sense can be incorporated.
into the evaluation of information strategies at HEIs. This is because CST allows critical reflection on a problematic situation from a social-theoretic point of view, suggests a plurality of methods that might be employed to clarify and address the situation, and proposes mechanisms that allow informed choice to be made among these methods.

(4) The research uncovered close links between widely accepted management theories (such as methods for analysing an organisation’s external and internal environments, managing strategic change and allocating resources) and the broader philosophical and CST ideas presented in this thesis. The specifics of management theory recommendations can be better understood and implemented when set against the wider context of themes relating to human behaviour and constraints.

(5) The research in addition helped identify the necessity for an inclusive nature to strategy formulation. This gave credence to the ‘emergent’ side of the ‘planned versus emergent’ strategy debate, with the framework offering techniques for incorporating the required elements of a strategy through a critical approach.

10.5 Limitations of the Research

For the empirical research of this project reported in Chapters 6 to 9 a number of well-established research methods were employed, including action research, ethnography and case study; and within these various additional research techniques were used. Although the benefits of these methods were evident, they also had some limitations and constraints. The main ones are as follows:

10.5.1 Constraints of Action Research

Action research, one of the key research methods applied for this project, generally involves the researcher influencing and changing the research situation.
Action research thus places a great deal of responsibility on the researcher, who must be aware that in certain circumstances he/she becomes aligned with a particular grouping whose objectives may well be at variance with other groupings (Galliers, 1985). The action research conducted for this thesis, as described in Chapter 6, was designed to investigate the problems with a Student Record System. As the researcher was acting as an ordinary system user entering students' data onto the system, it was not always easy to gain support and co-operation of others who were working under pressure (during the two weeks of student enrolment). In addition, it was found that people working in that environment, especially line managers, to some extent exhibited an anti-research attitude, and did not want an 'outsider' to 'influence' or 'change' the situation. More than once, the researcher was told off by some non-sympathetic managers for her 'misbehaviour' in the research situation. To ensure the validity of the action research, support was sought from the university’s top management. Therefore useful data were collected and the researcher, to a certain extent, ‘influenced’ and ‘changed’ the research situation (see Chapter 6). In addition, the researcher used various triangulation techniques to validate the data collected from other activities of the AR.

10.5.2 Difficulty in Collecting and Analysis of Qualitative Data

This research recognised that questionnaires are good for collecting data from a large number of people, but are sometimes difficult to interpret and may at times be superficial in the sense of providing facts about attitudes and behaviour but few explanations. That was why throughout this project questionnaires were often sent beforehand to potential respondents, with this as a preliminary to face-to-face interviews based on the questionnaire, with the interviews aiming to ask questions flexibly according to the development of the conversation.

However, face-to-face interviews, which were used as part of all the four empirical investigations for this research, though good for providing comprehensive information and understanding of individual attitudes were very
time-consuming. It took the researcher a great amount of time to carry out the many interviews (117 in total) required for the project at different universities and various workshop and conference venues.

As this was a qualitative research, it very rapidly generated a large amount of observation notes, interview transcripts, meeting minutes, documents, etc. Moreover this was normally textual material, and hence not straightforward to analyse. A lot of effort was made to interpret such textual data based on the understanding of the organisational culture and structure of the institutions investigated, and further insights were added with the help of relevant underpinning theories - critical social theory and critical systems thinking theory. In addition, the validity of the research was also achieved by triangulating data from different sources and seeking experts' views on the research topic.

10.5.3 Coverage of the Empirical Research Supporting the Framework

One of the possible limitations of this research is to do with the coverage of UK HEIs investigated for the development of the framework. Although people from many UK HEIs were listened to, and quite a large number of people formally interviewed, in the course of this work it was naturally not possible to achieve complete coverage of UK HEIs. It may be that significant findings would have come from people and institutions not contacted. On balance, however, given the degree of coverage that did take place, this researcher is reasonably confident of the broad validity of the findings presented here.

10.5.4 Independent Experience with the Framework

Another concern is with the limitation of the extent that the framework has been tested. Although the researcher herself made reference to the framework in the course of the empirical investigations described here, this is no substitute for having an independent researcher use the framework in a new situation. Again this
researcher has a fair degree of confidence in the general applicability of the framework proposed, but proper knowledge of this question can only come from the experience of other users. This issue is addressed in the section on ‘Further Research’.

10.5.5 Ethnography – Time-Consuming

To conduct an effective ethnographic research, the researcher had to ‘immerse’ herself in a social setting for an extended period of time, observing behaviour, listening to what was said in conversations and asking relevant questions for the research. Two pieces of ethnographic research were conducted for this thesis (Chapters 7 and 8) and an immense amount of time was spent. For example, as just a part of the data collection process for Ethnography I, the researcher was sitting at the 17 project meetings (of the research university’s Information Strategy Steering Group) held over a period of 18 months observing the whole decision-making process for the development and implementation of the university’s information strategy (see Table 5.4 in Chapter 5). And for Ethnography II, the participant observation at JISC’s 7 workshops and 3 conferences on information strategy covered a period of near two years (See table 8.1 in Chapter 8).

Therefore, it took much longer to complete the ethnography than had been planned for. However, the two pieces of ethnographic research turned out to be very ‘productive’, as they had substantial research findings which could not have been obtained otherwise. They also provided this research with rich insights into the human, social and organizational aspects of the development and implementation of information strategies of HEIs. Therefore, the researcher felt that the ethnography research contributed immensely to the whole project.
10.5.6 Difficulty in Getting Key Participants for the Research

Among the other difficulties the researcher encountered was that of getting access to, and support from, some of the key participants for the empirical research. This problem is not unique to this project, but is a ‘fact of life’ in all such research. For example, it was sometimes difficult to get adequate time from key people, such as information strategy project managers and other relevant people from the research sites. It was also sometimes difficult to build confidence in the research activities in order to get a dialogue going with them. Some people had to be chased for a long time as they had commitments to other activities more crucial to their responsibilities.

For example, for the case study, the researcher had to interview the person in charge of the development and implementation of the information strategy at the research institution. The interview was finally made through a succession of contacts. However, during the interview, she was pleasingly co-operative considering the difficulty in setting up the meeting and ‘generous’ in providing the researcher with the information required.

10.6 Further Research

10.6.1 Conducting a Test of the Final Evaluation Framework

The researcher would like to conduct a full test of the final evaluation framework of Figure 10.3 at one or more UK higher education institutions; possibly the University of Luton once the latter has fully implemented its information strategy. The aim of such a test would be to use the framework in conjunction with human-centred enquiry techniques to investigate if aspects of the strategy have been operating below expectation, to reflect problems encountered in light of the theories and practices set out in Chapters 2 and 3, and to combine various methodologies and techniques to address issues encountered.
10.6.2 Facilitating the Framework Implementation via Software

As the framework consists of a number of information strategy elements, each backed up by a considerable body of theory and practice that can be described at varying levels of detail, a natural development is to consider implementing the framework via software. This software could be similar to a web-browser, and allow the evaluator on selecting a given element to be automatically directed to increasing levels of information and support, including definitions, explanations, and links to original sources, so as to facilitate information retrieval.

10.6.3 Expanding the Study from Information Management to Knowledge Management

This researcher would like to expand the study from information management to knowledge management, and aim to understand to what extent CST ideas have been applied to knowledge management by a general review of relevant papers on this topic, and to explore further how Critical Systems Theory can assist in investigating and understanding human behaviour in knowledge management.
APPENDICES
Appendix A

Soft Systems Methodology (SSM)

Soft Systems Methodology originated as a means of dealing with complex managerial, as opposed to technically defined, problem situations because ‘hard’ systems approaches based on defining goals or objectives simply did not work when applied to ‘messy, ill-structured, real-world problems’ (Checkland, 1985). Checkland (1994:148) wrote subsequently that the intention of hard systems thinkers was ‘simply to try to apply the hard methodology to soft problems and to observe how the methodology had to adapt or change if successful problem-solving were to be achieved. The approach failed in such situations and had to be reconstructed’. After a decade of research, the outcome was Soft Systems Methodology (SSM).

As its main function, SSM, using a systems approach, allows participants to explore different ways of viewing a situation perceived as problematic. The implications of the different viewpoints are considered in terms of their relevance, cultural feasibility and systemic desirability (Checkland, 1981). This methodology incorporates human factors into the development process by taking a holistic and systemic view (Clarke, 1998). SSM recognises that different players may have different views about the aims, values, objectives, and purposes of the organisation, which are influenced by social and personal contexts, and individual experiences. Thus the process of SSM is designed to compare different views, and therefore, the active participation of the organisation members is essential.

Holwell (1997) devises four evolving representations of SSM (between 1972 and 1990), and Checkland (1999) accepts it. They are: 1972 – Blocks and arrows; 1981-Seven stages; 1988 – Two streams; and 1990 – Four main activities. These ‘show how the methodology has become less structured and broader as it has developed’ (Holwell, 1997:450). The following briefly reviews this changing perception of the methodology.

A. 1972 - Blocks and Arrows

The first account of what became SSM was Checkland’s paper – ‘Towards a systems-based methodology for real-world problem solving’ published in 1972. The paper argued the need for a methodology ‘of practical use in real-world problems’ (Checkland, 1972:
88), 'reviewed the context provided by the systems movement, introduced the case for action research as the research method, described three projects in detail, referred to six others, and described the emerging methodology'.

In the paper, Checkland presented the methodology as a sequence of stages with iteration back to previous stages. They are: analysis, root definition of relevant systems, conceptualisation, comparison and definition of changes, selection of change to implement, design of change and implementation, appraisal.

**B. 1981 – Seven Stages**

When the first book about SSM - *Systems Thinking, Systems Practice* (1981), was written, the engineering-like sequence of Checkland’s 1972 paper was changed into a ‘seven-stage’ learning process. These were:

- a. Entering the situation considered problematical.
- b. Expressing the problem situation in a ‘rich picture’.
- c. Formulating root definitions of relevant human activity systems.
- d. Building conceptual models of the human activity systems.
- e. Comparing models with perceptions of the real-world situation.
- f. Defining possible changes (‘culturally feasible’ and ‘systemically desirable’).
- g. Taking action to improve the real world problem situation.

This methodology 'is a learning system. It uses systems ideas to formulate basic mental acts of four kinds: perceiving, predicting, comparing, and deciding on action' (Checkland, 1994:17). Thus, the output of SSM is very different from that of hard Systems Engineering, since it is learning which leads to a decision to take certain actions, knowing that this will lead not to ‘the problem’ now being ‘solved’, but to a changed situation and new learning. This is a direct consequence of the nature of the concept ‘human activity system’.

One of the important features of the seven-stage model was that Checkland divided the seven stages into two categories - interacting with the ‘real world’, and the ‘systems thinking’ about it. According to Checkland (1981), ‘real-world’ activities will necessarily involve people in the problem situation, but ‘systems thinking’ activities “may or may not involve those in the problem situation, depending upon the individual circumstances of the study” (Checkland, 1981: 163). This distinction between the everyday world and the systems thinking about it was ‘intended to draw attention to the conscious use of systems language in developing the intellectual devices (the activity
models) which are consciously used to structure debate' (Checkland, 1999). For real-world situations, the normal language of the problem situation will be used; but for systems thinking, a higher-level language - 'the language of systems' must be used, for it is in this category that real-world complexity is simplified and understood. SSM thus involves two aspects: the seven-stage process which can be considered as the operation of a cyclic learning system; and the systems thinking used to generate the models within the seven-stage process which are used for learning about the existing system, for generating potential new views of it, and for debating about purposeful change.

C. 1988 – Two Streams

The two-stream model was first published in Checkland in 1988. This evolution was driven by a realisation that “analysis is not enough”, meaning that understanding a situation is only one part of the solution; the other part being the discovery of ways that effective action will be taken. The two streams of inquiry refer to a logic-driven stream (using activity models), and a cultural and political stream whereby ‘judgements can be made about the accommodation between conflicting interests which might be reachable by the people concerned, and which would enable action to be taken” (Checkland, 1999: A14).

By explicitly taking the cultural and political aspects into account, this version of SSM recognises, as Checkland (1999) writes “the crucially important role of history in human affairs. It is their history which determines, for a given group of people, both what will be noticed as significant, and how what is noticed will be judged” (Checkland, 1999: A15). This reminds us that when working in real situations we are dealing with something which is both perceived differently by different people and is continually changing.

D. 1990 – Four Main Activities

When it came to expressing the shape of the methodology in the book, *Soft Systems Methodology in Action* (Checkland and Scholes, 1990), Checkland (1999: A15) accepts that ‘the Seven-stage model was no longer felt able to capture the now more flexible use of SSM; and even the two-streams model was felt to carry a more formal air than practice was now suggesting characterized SSM use.’ Thus, the Four-activities model was presented in their 1990 book. Checkland (1999: A15) summarises the four activities, which, as reported one decade after its publication, are still relevant (Checkland, 1999).
The activities are: (a) Finding out about a problem situation, including culturally/politically; (b) Formulating some relevant purposeful activity models; (c) Debating the situation, using the models, seeking from the debate both changes which would improve the situation and are regarded as desirable and feasible, and the accommodations between conflicting interests which will enable action-to-improve to be taken; (d) Taking action in the situation to bring about improvement.

As illustrated by the four representations of SSM discussed above, SSM changed as experience of use accumulated, and as different parts of it gradually become more complicated. This indicated a clear shift from the 'engineering' atmosphere of the 1972's 'blocks and arrows' to the 1990's 'four-activities' model, with its deliberate reticence about the 'hows' and its avoidance of any implication of a prescription to be followed.

In broad summary, Checkland (1999) argues that the field of information systems had originally, rather surprisingly, neglected systems thinking as an underpinning to both its theoretical and practical concerns. However, the field unconsciously adopted the systematic systems thinking of the 1950s and 1960s. Since then great changes took place in the information systems environment, in information processing technology, and in systems thinking itself. The systematic systems thinking of the earlier decades was supplemented by the newer systemic systems thinking of the 1970s and 1980s. The process of development from 'hard' to 'soft' helped with problems of information provision in organisations in the 1990s.

Checkland's ideas have seen many real-world applications. Since the publication of System Thinking, Systems Practice in 1981, the Seven-stage model gave a version of the approach which, by 1990, had been applied in many real-world situations, with SSM being used in numerous organizations, large and small, in both the public and the private sector, as a vehicle for establishing the organizational requirements for information systems projects. These organisations included, in the UK, ICL, Shell, the Civil Service, and the National Health Service. There have been many reported case studies of the use of SSM, including: Episkopms and Wood-Harper (1986), Scholes (1987), Mingers (1992a), Moyes (1993), Ormerod (1993), and Stowell (1995).

Critique of SSM

As mentioned above, one feature of SSM is that it is itself a learning system, i.e. an organised process of enquiry, the form of which is based on systems ideas. Von Bulow (1989) supports this view maintaining that the aim of SSM is to find out about the problem context prior to undertaking any design activity, and "to bring about
improvement in areas of social concern by activating the people involved in a learning cycle which is ideally never ending”. Checkland and Haynes (1994) also stress that “Systemicity is focused on the process of enquiry rather than on the world. The learning takes place through the iterative process of using systems concepts to reflect upon, and debate, perceptions of the real world, and again reflecting on the happenings, using systems concepts.

However, there is no panacea; SSM cannot solve all the problems occurring in the development of information systems, and a variety of criticisms have surfaced. Among these have been the comments by Flood and Jackson (1991a), who point out that SSM can be considered as managerialist, reformist and unreflective, indicating that under many circumstances it would not necessarily lead to an emancipatory end result, but reinforce the existing situation by benefiting and serving those with power. Checkland defends against this by saying that SSM “both attacks and defends the status quo”. But it is probably fair to say that SSM focuses on finding out about the existing system, and leads to attempts to improve this system, rather than attempting to consider possible alternatives.
Appendix B

Critical Systems Heuristics (CSH)

The publication of Critical Heuristics of Social Planning (Ulrich, 1983), according to Jackson (2003: 213), “stands as a landmark in the development of systems thinking”, because Ulrich describes in the book, for the first time, “a systems approach that takes as a major concern the need to counter possible unfairness in society by ensuring that all those affected by decisions have a role in making them.”

The methodology of CSH involves the use of twelve critically heuristic boundary questions to reveal the normative content of the systems design, and to expose presuppositions. The power of the questions is best seen if they are put in ‘is’ mode and ‘ought’ mode, and if the answers are contrasted. Thus the questions, “who is the actual client of the systems design?” and “who ought to be the client of the systems design?” would be asked, and the answers to both questions would be compared.

These boundary questions are designed to highlight ‘sources of control, expertise, legitimating and motivation’ (Jackson, 1991a: 191). They can then be used by planners and others involved in the situation to show underlying value assumptions of the system design. The purpose is to expose in the design individual, organisational, cultural, societal and political value assumptions that may be hidden and coercive. By doing this, CSH uses an emancipatory systems approach. This revealing of ‘true’ motives in a planning situation may lead to new planning proposals.

CSH studies existing or planned systems from a point of view of discovering whose interests the system serves. It examines closely the assumptions and values associated with the system or proposed system. It is “a practically orientated emancipatory systems approach that can ensure planning and decision-making include a critical dimension” (Jackson, 2003: 214).

According to Midgley (1995b), CSH is concerned with subjecting assumptions in planning to ethical review. It asks both the researcher and participants in dialogue to address a number of questions concerning the issue of whose views should enter into the planning process, and how this should be achieved. Flood and Jackson (1991b) support Midgley’s view, saying that ‘this can support Habermas’ emancipatory interest’ in freeing ourselves from restrictive power relations.'
The CSH approach aims to challenge expert knowledge and expose *a priori* concepts. It recognises that social systems need to be designed as purposeful systems. It also recognises their systemicity; and the inevitable lack of comprehensiveness in producing social systems design. CSH has as a key principle the improvement of the human condition, requiring the incorporation of all the groups - the ‘involved and affected’.

CSH is based on Ulrich’s (1983) critical reflection of what *ought* to be done, and on instrumental, practical and emancipatory reason. Ulrich (1983: 220) argued for “a return to the Aristotelian position, which distinguished theory and practice”. He further explained that ‘reason’ was theoretical if it secures critical understanding of *what is*; and practical if it secures critical understanding of *what ought to be*.

Clarke (2001a) maintains that CSH was based on ‘a partial reconstruction of the Kantian position, and from this a critical reinterpretation of the systems approach to planning’. The heuristic intent of CSH places the methodology as a practical rather than theoretical approach. CSH, thus, is different from the approaches which regard knowledge as objective and independent of the observer, for it sees the enquirer as in the position of discovering and unfolding the problems presented. With reference to Kant, the critical understanding of heuristics emerges as a need for critical reflection in these circumstances (Clarke, 2001a).

Drawing from the literature (such as from Jackson, 1985a, ‘1991a, 2003; Willmott, 1989; Flood and Jackson, 1991a, 1991b; Mingers, 1992), the main strengths and weaknesses of CSH are summarised as follows:

- CSH offers an ‘inclusive’ systems approach that emphasises the benefits of incorporating the values of all those involved and affected in planning and decision-making, as it demands that attention be given to disadvantaged stakeholders, especially those affected by a design, but not involved in it.
- It is able to deal with simple cases of coercion; it encourages the confrontation of planners’ taken-for-granted assumptions; and it is emancipatory because of the emphasis throughout on discovering whose interests the system serves.
- It puts the concept of ‘boundary’ at the centre of systems thinking and makes it easy to see that drawing the boundary around a problem situation in different ways has massive impacts on how it is seen and what is done.
- In boundary judgements, CSH goes some way to challenging power, but Ulrich contains no procedures for examining and overcoming the underlying political
and economic forces that have resulted in the assumptions being taken for
granted, and neglects the structural aspects and development of social systems.

- Ulrich ignores the possibility of methodological pluralism. In particular, Ulrich
has been criticised for his intense dislike of hard systems thinking. But most HST
methods have been applied with insufficient regard to the consequences of
accepting given means and ends, and these approaches offer potential when
integrated into a framework of methods that can be reflected upon critically.

- In addition, Midgely (1997a) put forward a strong criticism of CSH saying that
for those whose interests have been served by coercion, submission to debate is
unlikely, and CSH, as a debating methodology, is doomed to failure.

The study of CSH has some implications for the empirical work of this research,
especially the idea of empowering the disadvantaged in problem situations involving
conflict.
Appendix C
System of Systems Methodologies (SOSM)

In the mid-1980s, Jackson and Keys developed the idea that since the different existing systems approaches had different strengths and weaknesses, they could be seen as 'a set with individual approaches', within which, 'each being more or less appropriate to particular problem situations and purposes' (Jackson, 2000: 367). The authors developed a grid with four boxes in 1984, representing four different types of perceived problem context, and then aligned different systems methodologies with each of these. These four boxes were later expanded to six by Jackson (1987b), and the authors called the resulting grid of contexts the System of Systems Methodologies (SOSM), as shown in the figure below:

People Complexity

<table>
<thead>
<tr>
<th>Systems Complexity</th>
<th>Unitary</th>
<th>Pluralist</th>
<th>Coercive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simple</td>
<td>Simple Unitary</td>
<td>Simple Pluralist</td>
<td>Simple Coercive</td>
</tr>
<tr>
<td>Complex</td>
<td>Complex Unitary</td>
<td>Complex Pluralist</td>
<td>Complex Coercive</td>
</tr>
</tbody>
</table>

*Jackson and Keys' 'Ideal-Type' Grid of Problem Contexts - Jackson's Extended Version (Based on Jackson and Keys, 1984; Jackson, 1990, 2000)*

As illustrated in the figure, the grid is made up of two dimensions. One defines the nature of the systems from *simple* to the *complex*; and the other the nature of the relationship between participants that ranges from *unitary* (agree upon goals), *pluralist* (have differences), to *coercive* (fundamental divergences, bound together by power) (Jackson, 1992). Combining these classifications yields the six-celled matrix of problem contexts. Jackson (2000) stresses that the existence of these ideal-types of problem context implies the need for a variety of problem-solving methodologies, and the differences among problem contexts should be reflected in different types of
methodology.

When Jackson and Keys (1984), and subsequent authors such as Jackson (1987b), Flood (1990), Midgley (1995a), conducted this alignment of methods with their ideal contexts of application, 'hard' (e.g. quantitative, modelling) methods, which assume that there is agreement what the research problem is, were said to be most appropriate for the unitary contexts, 'soft' (qualitative, debating) methods, which assume that there is disagreement that needs to be discussed, were regarded as best for pluralist situations, and 'emancipatory' (confrontative, boundary-challenging) methods were aimed at coercive contexts.

Based on Flood and Jackson (1991b), Jackson (2000) and Midgley (1997b), the following looks at the above distinctions in more detail, by summarising the six problem contexts, and listing some of the different approaches suitable for the assumptions of corresponding problem contexts.

**Simple Unitary**: Key issues are easily appreciated, and general agreement is perceived between those defined as involved or affected. (Traditional operations research techniques to organisational problem solving can be used, such as systems analysis, systems engineering, and systems dynamics, as these are based upon such assumptions.)

**Complex Unitary**: Key issues are difficult to appreciate, but general agreement is perceived between those defined as involved or affected. (Viable systems diagnosis, organisational cybernetics, general systems theory, socio-technical systems thinking, contingency theory, and complexity theory are based upon these assumptions.)

**Simple Pluralist**: Key issues are easily appreciated, but disagreement is perceived between those defined as involved or affected. (Some soft systems approaches such as Churchman's social systems design, strategic assumption surfacing and testing are based upon such assumptions.)

**Complex Pluralist**: Key issues are difficult to appreciate, disagreement is perceived between those defined as involved or affected. (Some soft systems approaches such as interactive planning, and SSM are based upon this set of assumptions.)

**Simple Coercive**: Key issues are easily appreciated, but suppressed disagreements are perceived between those defined as involved or affected. (Emancipatory systems thinking such as Critical Systems Heuristics are designed to handle situations with these characteristics.)

**Complex Coercive**: Key issues are difficult to appreciate, and suppressed disagreements are perceived between those defined as involved or affected. Complexity characterising the situations of concern hides the true sources of power of the various
participants. ‘Post-modern systems thinking’ might be said to be based upon such assumptions.

Overall, according to Midgley (1995b), the purpose of Jackson and Keys (1984) and Jackson (1987b) meta-theory SOSM is to classify systems methodologies according to the assumptions theory made about social reality. Jackson (2000) supports this, adding that the critical purpose of SOSM was the creation of a classification of systems methodologies that would allow for their complementary and informed use. Clarke (2001a: 3) also argues that the SOSM can be “used as the basis for an argument that the application of methodologies can be understood through determination of the problem context to which they are applied”.

The work of Jackson and Keys (1984) and Jackson (1987b) proved a major turning point. By looking at the range of different problem contexts and at the systems methodologies available for addressing these contexts, they provided a unified approach which drew on the strengths of the relevant methodologies, rather than debating which method is best; and argued for a reconciliation focusing on which method to use in which context, controlled by SOSM. Jackson (1985a) argues that this approach is appropriate to social systems where there are great disparities in power and in resource, and which seem to “escape” the control and understanding of the individuals who create and sustain them.

The breakthrough made by the SOSM, according to Jackson (1997), was that it suggested that pluralism needed to be based on methodologies (hard systems, cybernetic, soft systems etc.) that were developed from more than one paradigm. Mingers and Brocklesby (1996) also recognized this point, and according to Jackson (1999), they tried to map the characteristics of different methodologies according to their ability to assist ‘appreciation’, ‘analysis’, ‘exploration’ and ‘action’.

In spite of all its strengths, SOSM also has revealed some weaknesses. For example, Jackson (1999), in retrospect, notices that one of the main weaknesses is that it implicitly privileges ‘methodology selection’ as an approach to pluralism – the use of different methodologies in the same intervention is given little consideration.

Flood and Jackson (1991b: 242) stresses that SOSM is also “a framework that can be linked to the complementary interests of human beings: the technical, practical and emancipatory interests set out by Habermas”. In fact, Jackson (1987a) and Flood’s (1989) methodological pluralism (one of the three commitments) in CST makes explicit use of the ‘meta-theory’ (SOSM) to identify the strengths and weaknesses of different methodologies, which are viewed as complementary. Midgley (1995b) supports this view
saying that SOSM is underpinned by Habermas' (1972) three interests (discussed earlier in Section 2.3.3).

A review of SOSM shows that, when conducting an analysis on the real-world situations, we can see the problem contexts more clearly by organising systems-based 'problem-solving' approaches using the framework of SOSM. We can then make better decisions as to what to do to solve the problems based on the identified problem contexts. For example, when thinking of tools for tackling complex-coercive problem contexts, we need to take into account such situations as the various sources of power in the organisation, the organisation's culture and the way that decisions are made, and the relationship of hierarchies in the organisation.
Appendix D

Total Systems Intervention (TSI)

Total Systems Intervention (Flood and Jackson, 1991b) is a framework for problem solving (Ragsdell, 1995). It represents a new approach to planning, designing, ‘problem solving’ and evaluation. TSI was devised to provide practitioners with a usable approach that sticks to the original intent of systems thinking to be holistic (Flood, 1995a). It employs a range of systems metaphors\(^1\) to encourage creative thinking about organisations and the difficult issues that managers have to confront. These metaphors are linked through a framework, the SOSM (already described above), to various systems approaches to ‘problem solving’ in a process that ensure they are employed only to tackle the issues they are best suited to (Flood, 1995b). TSI is based on complementarist ideas, and can be broadly thought of as an approach which accepts the value of the diversity of available methodologies, and the richness that this offers for dealing with a varied and changeable social world. It accepts openness and conciliation, and aims to overcome coercion by use of a debating method.

TSI seeks to operationalise pluralism by embedding ‘problem solving’ approaches in an interactive three-phase process - ‘creativity’, ‘choice’ and ‘implementation’. Originally in the creativity phase, managers were assisted to think about the main issues to be dealt with in their organisations at that point in time. This then becomes the basis for the second phase - a choice of an appropriate intervention methodology (or methodologies). However, Ragsdell (1995) implied that the original notion of creativity in TSI (based on metaphors) was a little restricted since a problem manager’s thinking was being constrained and limited, and noted that the newer version of TSI (Flood, 1995a) “took a wider perspective of creativity” (Ragsdell, 1995: 167). She went on to suggest that ‘a critical form of creativity was appropriate for use in TSI’, and put forward various practical measures for its pursuit.

In the choice phase, originally the SOSM (Jackson and Keys, 1984) was used to reveal the strengths and weaknesses of possible candidate methodologies, and an appropriate intervention methodology (or methodologies) chosen, on the basis that its

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\(^1\) They refer to Flood and Jackson’s (1991b: 7) systemic (or systems) metaphors – machine metaphor, organic metaphor, neurocybernetic metaphor, cultural metaphor, and political metaphor.
strengths made it suitable to address the issues and problems identified during ‘creativity’ stage. For the choice of methodology (or methodologies), Flood (1995a) suggested a complementarist framework addressing issues of designing, debating and ‘disimprisoning’ by asking questions such as how we should do it, what we should do, who will benefit, etc. This is an approach different from the problem context grid suggested in SOSM. Whichever method is used in the choice phase, the most probable outcome is that there is a ‘dominant’ methodology chosen.

During the ‘implementation’ phase, the methodology (or methodologies) chosen in the choice phase as most suitable is employed to deal with the problems that have surfaced within the current problem situation. And in the process of implementation, critical reflection should be made as to whether these are the most suitable methodologies.

It is stressed that any methodology should be used in an iterative manner. Participants’ views of what are the main problem areas will change, and the intervention itself will move the problem situation on. The only way to deal with these matters is to continually cycle around creativity, choice and implementation, changing as appropriate which methodology is dominant’ and ‘dependent’.

Flood and Jackson’s (1991b) principles embedded in the three phases TSI are based on the general notion that organisations are too complicated to understand directly, and the problems they confront too complex to tackle. As a result, their strategies and difficulties should be investigated using a range of system metaphors to highlight the strategies and problems they confront, and link them with appropriate system methodologies to guide intervention. TSI is seen to have its roots in the critical social theory of Habermas. It has followed Habermas in “seeking to promote the three human interests in control, communication and emancipation” (Flood and Jackson, 1991b).

As an extraction of TSI, Clarke and Lehaney (1996) devised a framework for assessing individual methodologies. According to them, methodologies can be mapped on to a matrix (see the table below) with the positioning showing whether the methodology addresses best issues of creativity, choice and/or implementation, mapped against Habermas’ three cognitive interests - technical, practical or emancipatory.
TSI is the practical application of CST to guide practical interventions. It aims to apply relevant methodologies where they can make a legitimate contribution. It is a continuous, iterative, and recursive process, which is critically reflective and uses methodologies in a complementarist fashion. The approach of TSI has been tried and shown to work well in a number of circumstances, particularly those that reflect assumptions inherent in the methodological approaches about the nature of the organisational and social context.

However, it is recognised that TSI demands multi-methodological competence and various ethical commitments from its practitioners, and asks a great deal from would-be users, without detailing whether, or how, such competence can be obtained. It may be that these requirements have hindered the more widespread use of the approach in practice.
Appendix E

Techniques for Identifying Information Needs

a) *Functional analysis*

Functional analysis is an analysis of the processes of the institution and the information needs and the products of these. It is a top-down analysis of the functions within an HEI that starts at the highest level division of the institution’s activities, and then breaks down each of these successively. In theory, there is almost no end to this process of division; but in practice the divisions are generally taken to two or three levels, with the purpose being to arrive at levels where the information groups are obvious.

JISC gives an example of such a process: it starts from a four-way split of an institution (strategy, teaching and learning, research and consultancy, management of resources) and then breaks each of these down in two successive steps, as shown in Figure 5.2.

The aim is then to carry out an analysis of information needs for each of the subdivisions identified, or at least for those that have been prioritised in the current activity. The specific ‘information needs’ data are then collected though interviews or workshops with those involved in the processes concerned. As JISC points out, “it is expected that any gaps and problems with the information will become evident during these discussions”.
Figure 5.2 Functional analyses of the processes of the information needs

(1) Teaching and Learning
- Plan, develop and validate Schemes
- Prepare and deliver schemes
- Assess students
- Evaluate and review schemes

(2) Research and Consultancy
- Plan activities
- Identify and obtain funding and resources
- Undertake research
- Publicise results

(3) Student Services
- Admit and register students
- Maintain student records
- Provide 'hotel' and welfare services
- Provide results, certificates, graduation and references

(4) Managing the Institution
- Strategic planning
- Manage resources
- Marketing and publicity
- Manage enterprise
b) Life-Cycle analysis

The life-cycle analysis, according to JISC, is perhaps most usefully used by taking the students' or a member of staff's association with the institution through all its stages. It can also be used in connection with other processes, such as "The Life-Cycle of a Course" through development, approval, implementation and review. For example, a student life-cycle may includes four key stages:

- Pre-student - attraction to the institution or to the course on offer, application (interview, clearing), and offer
- New student - arrival, accommodation, registration, induction, and so on.
- Course - course (teaching, communications, library, computing); assessment (assignments, practicals, and exams); results, appeals, re-sits, administration, etc.
- Post-student - graduation, alumnus

In order to gain a comprehensive indication of the students' information needs at each stage of their association with the institution, it is necessary to be aware of the wide range of types of students within the institution. For example:

- those at different stages of their course
- those on different types/modes/modules of course
- local, national and international students
- undergraduates and post-graduates
- different age groups
- those with family responsibilities
- those with disabilities
- the range of previous educational experiences
- those on different campuses, etc.

Thus, the data to be obtained from this analysis is the students' information needs/requirements at each of the stages of their association with the institution, and the identification of issues, gaps or problems they encountered with this information. Appropriate methods of obtaining these data may include workshops and/or questionnaires.
c) Information initiatives

Information initiatives refer to the approach of building on information projects already in process. JISC notes that an institution may feel that its information systems and flows are too complex to get to grips with within a single analysis at the outset, and outlines this as an approach which may be useful for getting started. Later, a broader approach to information can evolve as the Information Strategy Group gains experience with the practical problems thrown up by people working to solve problems within the institution.

JISC recommends that where there are a number of information initiatives already in place or planned, it might be possible to utilise some of these to drive forward the development of the information strategy. For this to be successful, it is essential to have the co-operation of those involved in the projects, and that the emphasis be on information. JISC also mentions that where suitable initiatives have been identified, the Information Strategy Group can provide support, possibly resources, and guidance for those already involved to encourage their co-operation and bring greater publicity to the initiative. Thus, the Information Strategy Group can see how their ideas can develop in a practical setting.
## Appendix F Action Research: Records of Interviews

(Between September 1999 and May 2000)

<table>
<thead>
<tr>
<th>Ref. No.</th>
<th>Post held</th>
<th>Interview Date</th>
<th>Starting Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>SRS-992001</td>
<td>Systems &amp; Network Manager</td>
<td>27-Sep-99</td>
<td>10.00am</td>
</tr>
<tr>
<td>SRS-992002</td>
<td>Co-ordinator - Postgraduate Programme</td>
<td>9-Nov-99</td>
<td>2.20pm</td>
</tr>
<tr>
<td>SRS-992003</td>
<td>Psychology Field Manager</td>
<td>1-Oct-99</td>
<td>10.00am</td>
</tr>
<tr>
<td>SRS-992004</td>
<td>SRS Analyst</td>
<td>1-Oct-99</td>
<td>2.10pm</td>
</tr>
<tr>
<td>SRS-992005</td>
<td>Lecturer - Tourism &amp; Leisure</td>
<td>3-Nov-99</td>
<td>5.00pm</td>
</tr>
<tr>
<td>SRS-992006</td>
<td>SRS Analyst &amp; Programmer</td>
<td>6-Dec-99</td>
<td>1.45pm</td>
</tr>
<tr>
<td>SRS-992007</td>
<td>Modular Scheme Officer</td>
<td>7-Nov-99</td>
<td>11.45am</td>
</tr>
<tr>
<td>SRS-992008</td>
<td>Systems Manager</td>
<td>10-Nov-99</td>
<td>4.00pm</td>
</tr>
<tr>
<td>SRS-992009</td>
<td>Head - Foreign Languages</td>
<td>11-Sep-99</td>
<td>3.50pm</td>
</tr>
<tr>
<td>SRS-992010</td>
<td>International Office Assistant</td>
<td>1-Nov-99</td>
<td>1.15pm</td>
</tr>
<tr>
<td>SRS-992011</td>
<td>IS Development Manager</td>
<td>12-May-00</td>
<td>3.15pm</td>
</tr>
<tr>
<td>SRS-992012</td>
<td>Assistant Librarian</td>
<td>17-Oct-99</td>
<td>12.30pm</td>
</tr>
<tr>
<td>SRS-992013</td>
<td>Lecturer - Humanities</td>
<td>18-Nov-99</td>
<td>4.50pm</td>
</tr>
<tr>
<td>SRS-992014</td>
<td>Dept. Administrator - Business School</td>
<td>21-Feb-00</td>
<td>12.30pm</td>
</tr>
<tr>
<td>SRS-992015</td>
<td>Database Officer</td>
<td>2-Oct-99</td>
<td>11.15am</td>
</tr>
<tr>
<td>SRS-992016</td>
<td>Trainee Database Administrator</td>
<td>2-Oct-99</td>
<td>3.00pm</td>
</tr>
<tr>
<td>SRS-992017</td>
<td>Head - Quality Assurance Division</td>
<td>27-Sep-99</td>
<td>4.40pm</td>
</tr>
<tr>
<td>SRS-992018</td>
<td>Director of Information Services</td>
<td>29-Sep-99</td>
<td>2.30pm</td>
</tr>
<tr>
<td>SRS-992019</td>
<td>Deputy Head - Access &amp; Admissions</td>
<td>29-Sep-99</td>
<td>4.30pm</td>
</tr>
<tr>
<td>SRS-992020</td>
<td>Senior Lecture &amp; Course Manager</td>
<td>30-Sep-99</td>
<td>11.15am</td>
</tr>
<tr>
<td>SRS-992021</td>
<td>Field Manager - Sports</td>
<td>30-Sep-99</td>
<td>3.00pm</td>
</tr>
<tr>
<td>SRS-992022</td>
<td>International Student Co-ordinator</td>
<td>30-Nov-99</td>
<td>1.30pm</td>
</tr>
<tr>
<td>SRS-992023</td>
<td>Analyst &amp; Programmer</td>
<td>4-Nov-99</td>
<td>3.20pm</td>
</tr>
<tr>
<td>SRS-992024</td>
<td>Software Administrator</td>
<td>5-Oct-99</td>
<td>3.30pm</td>
</tr>
<tr>
<td>SRS-992025</td>
<td>Assistant - Systems &amp; Networks</td>
<td>5-Oct-99</td>
<td>9.50am</td>
</tr>
<tr>
<td>SRS-992026</td>
<td>EMIS System Manager</td>
<td>5-Nov-99</td>
<td>4.00pm</td>
</tr>
<tr>
<td>SRS-992027</td>
<td>Student Data Analyst &amp; Programmer</td>
<td>6-Oct-99</td>
<td>11.10am</td>
</tr>
<tr>
<td>SRS-992028</td>
<td>Field Manager - Humanities</td>
<td>7-Sep-99</td>
<td>12.45pm</td>
</tr>
<tr>
<td>SRS-992029</td>
<td>Administrator - Humanities</td>
<td>7-Oct-99</td>
<td>4.50pm</td>
</tr>
<tr>
<td>SRS-992030</td>
<td>Administrator - I. D. Cards</td>
<td>7-Dec-99</td>
<td>5.50pm</td>
</tr>
<tr>
<td>SRS-992031</td>
<td>Manager - Access and Admissions</td>
<td>8-Oct-99</td>
<td>9.45am</td>
</tr>
<tr>
<td>SRS-992032</td>
<td>Technician - Computer Services</td>
<td>8-Nov-99</td>
<td>3.00pm</td>
</tr>
</tbody>
</table>

* To preserve the privacy of the interviewees, their names are hidden.
Appendix G

Action Research: Sample Transcripts

Sample 1 – A system manager

Reference Number: SRS992007
Date of Interview: 07-11-2000

What do you think are the main functions of the Student Record System (SRS)?

- It has many functions, and it is versatile. It can do everything for you.

What do you use the SRS for?

- Maintenance of the assessment database, and production of certificates and examination timetables.

What do you like about the system?

- It is quick, varied and does everything that is needed to be done.

What are your main complaints about it?

- But there are too many people entering data and there is an abuse of the alert text message so staff no longer rely on this source of information. Performance is slow at the moment. The speed to get amendments to reports is a problem. There are also problems with networks not communicating with ACS, and faculties not having access to a printer for a whole week. At present exam duration is not listed on the system because there are no free fields. This would assist greatly when producing the exam timetable.

How easily can you access the information required for Subject / Department Review? If this is not easy, what other sources of information do you use in relation to student records?

- It all depends. I use a separate database for certificates. Information is downloaded from the SRS into an Access database, which is more flexible in allowing changes to names and titles.

2 In the sample transcriptions, reference numbers have been used to preserve the anonymity of respondents.
How far does the information available on the system reflect the information you required for managing various programs/projects?

- The system completely reflects the information required to teach modules, manage programs and produce annual reports. Progression statistics are not widely available for the annual monitoring reports as they are usually produced manually by the Head of the Modular Scheme but there is no reason why this should be the case as a report could just be specified to ACS and included on the standard menus.

How do you think we ought to do to manage the input and output of the system?

- The input of information should be managed by a database management team. The Module Office is expected to do this to a certain extent now but it is hampered as they do not manage all the changes to the data. Quality Assurance now has responsibility for some aspects such as creation of new module codes. Managers, especially the Faculty Registrars should possess an understanding of how the system operates. Problems were caused this year by automatic enrolment on core modules. This can only be managed if modules are not repeated in two semesters but nobody asked whether it would work or tested it before students enrolled.

Who do you think ought to specify what information is needed and how it should be presented?

- A database manager who is informed by a user group of faculty and centre representatives.

What training has been provided to you for using the system?

- None. I trained myself.

Where do you go if you have to resolve problems with the system?

- Queries are usually directed to ACS. The University relies too much on informal lines of communication.
How do you think the system should be managed?

• By a database management team supported by two programmers per area (e.g. Finance, Admissions, Assessment, Enrolment).

Sample 2 – A lecturer

Reference Number: SRS992013
Date of Interview: 18-11-2000

What do you think are the main functions of the Student Record System (SRS)?

• I am not quite sure.

What do you use the SRS for?

• Not a personal user but would like to be. Uses student transcripts, module lists and course lists for language programs.

What do you like about the system?

• The information that can get out of the system is generally useful.

What are your main complaints about it?

• It is not possible to record information about external examinations that the students take.

How easily can you access the information required for Subject / Department Review? If this is not easy, what is your alternative way of obtaining the information?

• Not easy at all. Keep paper records of external examinations taken by students and modules previously completed.

How far did the information available on the system reflect the information you required for managing various programs/projects?

• Do not receive any information about student cohort from the system for annual reports. Information about student qualifications, age, ethnicity, etc. would be useful. This information should be collected at registration.
Sample 3 – An administrative user

Reference Number: SRS992010
Date of Interview: 01-11-2000

What do you use the SRS for?
  • Viewing student records, printing reports on international student admissions and enrolments. Using student addresses to inform students about social events.

What do you like about the system?
  • The reports that are available are good. It is possible to print an application summary by country and break down this information into names, course and faculty.

What are your main complaints about it?
  • The system is not user friendly. The keys are not logical. Instructions or a guidance manual would be useful, as would a summary screen.
  • It was not made clear to users what happened over the summer with EMIS and why the server changed from alpha5 to alpha4. The University should keep staff more informed about system development.

How easily can you access the information required for Subject / Department Review? If this is not easy, what other sources of information do you use in relation to student records?
  • There was concern about the reliability of the current enrolment figures. The number of international students looked realistic but upon further investigation there are indications that the figures are not fully accurate. The only secure system seems to be to keep paper based records.

How far did the information available on the system reflect the information you required for managing various programs/projects?
  • It was not clear from the EMIS admission system whether the tuition fee or the accommodation cheque had been received.
How do you think we ought to do to manage the input and output of the system?
• N/A

Who do you think ought to specify what information is needed and how it should be presented?
• N/A

What training has been provided to you for using the system?
• They have had no formal training on the SRS and I learned through a brief session in Admission but mainly through trial and error.

Where do you go if you have to resolve problems with the system?
• N/A

How do you think the system should be managed?
• N/A

Sample 4 – A main system user

What do you think are the main functions of the Student Record System (SRS)?
• N/A

What do you use the SRS for?
• Input data to admit students or to look up information to make a decision on an offer.

What do you like about the system?
• The new EMIS admissions software provides a good tracking facility to enable an audit trail to be produced of everything entered on the system. It lists when information was entered and by whom so incorrect offers can be traced to a person.
• It also records whether information has been acknowledged by UCAS. It keeps a record of everything that has been sent to a student. This is really useful and is a new feature which was not available with the HEMIS system.
What are your main complaints about it?

- It has taken a year to overcome the problems experienced with the new system but it is still slow. With HEMIS, 100 offers from information that had been downloaded from UCAS could be made in a shorter period of time. Staff who are inputting the data into EMIS now have to go into three different screens to generate an offer which has slowed the process considerably. The standard letter package is also very slow and can not cope with large numbers.

- There are many duplicate student records and the problem probably lies at the admitting stage. EMIS does pick up duplicates but allows the user to make a duplicate record even though it provides a warning that a duplicate may exist. There is no stop on the field. In order to make an offer, there is a tendency for the user to create a new record rather than investigating why there is a duplicate. The system should stop the user from making an offer if a duplicate exists.

- On the new clearing screens there is not a field to enter A’ level points although this was present on the system used last year. The user must ask the applicant for this information but there is nowhere for it to be recorded which is a major problem. Admission did ask ACS to customise the software to provide a mandatory field but this was not done.

- A major problem is having to use different systems for different functions, namely EMIS for admissions and HEMIS for the student record system. Users who are not based in the Admission Department will not experience this problem as they get the admissions information transferred across to HEMIS.

How easily can you access the information required for Subject / Department Review?

- N/A

If this is not easy, what other sources of information do you use in relation to student records?

- Admissions keep their own database for some details. An Access database is used to record current offers being made as the upgrade from EMIS was not
ready and it was necessary to revert to the manual system. The original paper copy of the application form is retained for three years.

How far did the information available on the system reflect the information you required for managing various programs/projects?

- The information required to teach modules/manage programmes/produce annual reports is present on the system but it is a question of accessibility and it is not clear how to produce a non-standard report.

How do you think we ought to do to manage the input and output of the system?

- It is also not clear who is responsible for providing data. The system is used on a trial and error basis. If data is incorrect for HESA returns then it is because nobody has ever said what was needed in the first place.

Who do you think ought to specify what information is needed and how it should be presented?

- There needs to be input from a number of different departments as there are certain reports that are not university-wide. The university’s Head of Statistics should communicate what data is required in the first instance and then additional requests from the users should be added.

What training has been provided to you for using the system?

- I cannot remember having any training.

Where do you go if you have to resolve problems with the system?

- There is no one person to contact to resolve queries with the SRS. The person who is approached depends on the problem. With a system problem it is often a guessing game about whether it is ACS or Networks. There should be a list of contact names for specific problems with the system.

How do you think the system should be managed?

- A central office with clear lines of communication so that staff know where to go for reports and assistance.
### Appendix H Action Research: Key Findings

<table>
<thead>
<tr>
<th>Problems</th>
<th>Examples</th>
<th>Causes</th>
<th>Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. The SRS produces incomplete information.</strong></td>
<td>There is no cross-referencing to record whether a student is repeating a module or whether they are carrying grades forward. The system does not regularly report student progression data broken down by levels. This has to be calculated manually. Students are randomly omitted from examination board reports. Exam duration is not recorded on the system. An overall decision is not recorded when a student has two referrals for one module and passes one aspect but not the other.</td>
<td>Missing data or fields for data on the system. An overall grade for a module is not provided on student transcripts and examination board reports after referral.</td>
<td>Creation of appropriate fields. Devolved responsibility with people for the data entered. Faculty staff to notify ACS of examples of errors so that cause can be identified and rectified. Include exam duration. Provide information that is easily comprehensible to both students and staff.</td>
</tr>
<tr>
<td><strong>2. The SRS produces wrong information.</strong></td>
<td>At examination boards there is always a high number of Sts recorded as non-attempts but these Sts have never attended the module. The SRS provided a report which said that a St had not submitted a piece of work but the St was able to produce a receipt. Sts contacted the university when they received standard letters regarding absence to say that they had never attended the university or that they had graduated several years previously. Sts have replied to a mail shot that was distributed about poor attendance saying that they have never enrolled at the Uni. Information is sent to students at the wrong address, to students who have withdrawn from the University and to students who have never commenced a course.</td>
<td>Too many people entering data on to the system. One St may have more than one ID. Procedure for student withdrawal and change of address has not been formalised and communicated to all staff and students.</td>
<td>Enrolment should be conducted by a central core of well trained staff who are aware of the ramifications of missing information. These people should have a thorough understanding of the SRS and have an academic background. Conduct proper user testing of systems before they go live. Introduce an address history facility to show an old address being updated and by whom. Provide students with access to check their personal details. Improve the customer focus of the University's services.</td>
</tr>
<tr>
<td><strong>3. The SRS produces unsatisfactory information.</strong></td>
<td>A St was found to have enrolled on 17 modules! The SRS fails to record what modules are core for each programme and to produce an exception report for any Sts who do not meet the requirements. The Business School's external examiners were not happy with the presentation of assessment information, and the school had to design a spreadsheet to enable graphs to be produced. Information is duplicated on different screens which increases the likelihood of problems. E.g. study mode and fee payer information.</td>
<td>The system cannot check individual St transcript automatically to ensure that Sts are enrolled on the right number of modules.</td>
<td>Prevent entry of more than eight modules for a student in any one year. Need the ability to manipulate data and produce information in a variety of formats. Removal of duplicate fields or creation of facility to prevent conflicting information from being entered.</td>
</tr>
<tr>
<td>Problems</td>
<td>Examples</td>
<td>Causes</td>
<td>Solutions</td>
</tr>
<tr>
<td>-----------------------------------------------------------------------</td>
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</tr>
<tr>
<td>4. The SRS produces ambiguous information.</td>
<td>It is not clear how many assessment points there are for a module or which modules are cores. The SRS does not clearly state the level at which a St is studying although inferences can be made from the level of modules that a student is taking. It also does not state in an easy format whether students are studying a single, major-minor or joint programme. On the St transcript, it is difficult to determine whether students have got sufficient credit as it is ordered by year rather than level.</td>
<td>There is no explanations on the asterisks that are used to indicate that a student has been issued a receipt, is repeating a module or is borderline. The statistics on module pass rates should be updated after the referral examination boards to provide the complete picture. There should be a distinction between a fail for a referral student who submits work of poor standard and a fail for a non-submission of referral work.</td>
<td>It is necessary to go through the reports individually correcting and annotating them to make sure the information is accurate. Ensure accuracy of information available to meet the needs of teaching, learning and assessment.</td>
</tr>
<tr>
<td>5. The SRS produces inaccurate information.</td>
<td>There are always a lot of errors in the synoptic reports provided for examination boards. Incorrect information about course fees, when the course began and how and when a part-time student could enrol. The synoptic reports are inaccurate and have to be gone through individually to be checked in detail which is extremely time-consuming. The assignment history facility is not always reliable.</td>
<td>The way the system has been set up by the programmers is not right. Data input is in a great hurry; Lack of time to go through these reports.</td>
<td>It is necessary to go through the reports individually correcting and annotating them to make sure the information is accurate. Ensure accuracy of information available to meet the needs of teaching, learning and assessment.</td>
</tr>
<tr>
<td>6. The SRS produces insufficient information.</td>
<td>Very often the basic information about the current status of the student is not available. E.g. whether they are live, withdrawn, completed; home or overseas, what the weightings are for each module and the number of assessment points, whether the student is taking each module as a core, option or elective; whether St numbers are FTEs or bodies. The undergraduate classification of a postgraduate student is not currently recorded on the system. There is no distinction provided on the system between a fail for a referral student who submits work of poor quality and a fail for non-submission.</td>
<td>Information is not included. No definitions of data are supplied in standard reports.</td>
<td>There is a need for summary to show st totals of: full-time/part-time; overseas/EF; postgraduate/undergraduate. Conduct proper user testing of systems before they go live. Provide staff and students with comprehensive and accessible information. Distinction should be made between types of failure on student transcripts and examination board reports.</td>
</tr>
<tr>
<td>7. Students are incorrectly enrolled on modules in the wrong semester.</td>
<td>Inaccuracies in the basic list of modules that are running in year 99/00.</td>
<td>It is essential there is a definitive listing somewhere in the university of the modules available in any one year.</td>
<td></td>
</tr>
<tr>
<td><strong>Problems</strong></td>
<td><strong>Examples</strong></td>
<td><strong>Causes</strong></td>
<td><strong>Solutions</strong></td>
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<td>----------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>8. The SRS is not updated soon enough to produce students’ reports.</td>
<td>The module fee for year 99/00 increased from £125 to £128, but this was not changed on the system. So students were enrolled for the wrong fee. The availability of pass rates after referral is not updated early enough after referral examination boards. An overall decision is not recorded when a student has a referral in an assignment and an exam for the same module and they pass one element and not the other. Information about graduates is not updated.</td>
<td>One person holds all the knowledge for a particular task. First time referrals cause problems every year as they do not appear on the referral grade sheets. Information is held locally.</td>
<td>The availability of pass rates after referral should be updated immediately after referral examination boards. Updated information on students must be entered on to the SRS ASAP. Appoint an Alumni officer to update graduate information.</td>
</tr>
<tr>
<td>9. The SRS does not provide information about student cohort for the annual reports.</td>
<td>There are no records of historical students. No information about A level qualifications, age, ethnicity, etc. It is not possible to keep a record on the SRS of maternity or long-term sickness breaks. The university often lost touch with international graduates. Details of A-level points had often not been entered. Data about ethnicity was also missing from some students’ records. Accurate information on progression rates is required for the Annual Course Monitoring reports, but this is never provided. It is necessary for the Field Manager to use the examination board reports to calculate the information on progression manually.</td>
<td>An overseas home address was never entered on the SRS. Information on such areas is missing.</td>
<td>Former St records should continue to be treated as 'live' records and attempts made to continually update the contact details. It should be mandatory that all international Sts have an address in their home country recorded on the SRS as well as a local address. Data entry for some fields should be mandatory. The transcripts should show a student’s history of study aims. A history of progression decisions should also be recorded on the transcript.</td>
</tr>
<tr>
<td>10. The SRS does not record/produce core data required for HESA returns, HEFCE research, or Subject Review (e.g. A-level points, occupational codes)</td>
<td>When making returns to HEFCE the number of Sts included on the return and recorded on the SRS did not match. Basic information such as ‘unit of assessment’ which has to be included in the return to HEFCE is not recorded. Offers were made for combined courses under the general UCAS code Y400, but the full name of the courses to be combined were not listed in the appropriate fields.</td>
<td>Information needed has not been specified properly No validation routines. Lack of communication between the staff who provide the HESA returns and those who enter the data.</td>
<td>Specify information required by external bodies. Mandatory fields to be created for mandatory data entry. Information available from UCAS to be transferred to the SRS. Establish/improve lines of communication.</td>
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<td>Problems</td>
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<td>11. The SRS fails to meet the needs of various short-term projects (including nursing and midwifery, HND, and research programmes).</td>
<td>There are always problems with HND students who have transferred on to degree programmes in relation to their progression decision or the calculation of their classifications. The SRS is not used by the LCB (Language for culture and Business) Project and International Office for any purpose other than the generation of an ID number. It is not possible to record information about external examinations that the students take. No place to record students' grades for individual assignments.</td>
<td>The SRS leaves no room for flexibility. The SRS failed to identify groups, such as HND students, as a different one.</td>
<td>To devise a means to meet these needs more flexibility needs to be created. It would be useful to record exam results and also to list the IOL modules that have been successfully completed on previous occasions so that the Course Team would know when a student was due to complete the Diploma. Provide staff with accessible information that they need to complete their daily duties.</td>
</tr>
<tr>
<td>12. Module numbers and lists are provided too late to assist with timetabling and production of lecture materials. It is also not possible for lecturers to monitor the progress of students throughout the semester.</td>
<td>No information is accessible mid-semester to check the progress of a St, and attendance records are not entered. The SRS is not able to produce tutorial lists for modules to track attendance.</td>
<td>Cannot be earlier. All grades are entered at the end of the semester.</td>
<td>Pre-plan to provide timely information. Review system for pre-enrolment on modules for returning students. Enter absences and general progress information on to the SRS. Enable the SRS to produce tutorial lists for modules to track attendance. The university should work harder to ensure that returning students provisionally choose their modules before they leave at the end of the academic year.</td>
</tr>
<tr>
<td>13. The SRS does not produce any information that is useful for the Research Centre.</td>
<td>The Statistics needed for the annual report (to the university Research Degrees Committee) on completion rates, the length of time needed for a PhD, withdrawals, transfers, etc are calculated manually. No information from Finance about the research grants that the university receives and details about how much, who for and from whom. Fee waivers are completed for research Sts on bursaries but these Sts received repeated invoices in 1999.00.</td>
<td>The data entered is undergraduate Sts based, not enough information is available for research Sts on the SRS. Lack of communication.</td>
<td>Improve the data input and output of research Sts. Provide a separate Access Database to be maintained by the Research Centre. Contact individual faculties to find out necessary information about relevant problems.</td>
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<td>Problems</td>
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<td>14. There is no formal staff training on the SRS, and users are not informed of the use of the SRS to its full potential.</td>
<td>It has only recently become evident that File Transfer is possible. It is not known that it was possible to obtain registers for seminar groups from the SRS.</td>
<td>Lack of training for SRS users No written guidelines for using the system.</td>
<td>Provide training and retraining for different levels of users to update knowledge and skills of staff. Issue updated full written procedures in manual form. Provide frequently asked questions and answers on the website. There should be a designated SRS ‘expert’ in each Faculty to fully interrogate the SRS and to write reports.</td>
</tr>
<tr>
<td>15. Poor communication and dissemination of information about system development, new initiatives, changes to regulations.</td>
<td>An auto-enrol facility was introduced for core modules in year 98/99, but this was not communicated to the staff enrolling students on the modules, the faculty staff who were advising SIs on module choice or the students who were completing their MODS1 forms. A significant amount of effort could have been saved if this had been handled properly. It was not made clear to users what happened over the summer (99) with EMIS and why the server changed from Alpha5 to Alpha4.</td>
<td>Lack of the empowerment of people to control information flow. Regular updates are not provided to all staff. Feedback is not provided when a report fails to print to inform the user of the problem.</td>
<td>Improve methods for disseminating information. Keep staff more informed about SRS developments. Provide faculties with a written summary of decisions agreed by the Scheme Board. Provide staff with comprehensive and accessible information.</td>
</tr>
<tr>
<td>16. Effort was wasted for creating duplications of the same information at various levels or sections.</td>
<td>The duplication of committees/groups working parties within the university appeared to be looking at similar, if not the same issues.</td>
<td>Lack of communication and the culture of sharing information. Staff miss out on information because they do not know what is being made available to other staff. The EMIS system does not prompt the user that there may be a duplicate record until after the third screen.</td>
<td>The SRS needs to be more powerful and able to search for anomalies such as duplicate records, Some form of artificial intelligence is needed rather than just a database. There needs to be one person co-ordinating the generation of reports. There needs to be better training to make staff aware of the ramifications. To establish a culture of sharing information amongst all staff. Introduce an audit trail for all data entered on a student’s record.</td>
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<td>Problems</td>
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<td>17. Changes are always made to the system just before key activities, such as clearing, enrolment, and examination boards, which often results in reports not working properly.</td>
<td>In year 98/99, the synoptic reports were not available for the internal examination boards.</td>
<td>The system has not been tested early enough.</td>
<td>Sufficient time is needed for testing to be incorporated into schedules of work.</td>
</tr>
<tr>
<td>18. Some students have more than one ID number. This is complicated further by the fact that the Accommodation Dept's system feeds off the SRS.</td>
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<td>19. Not all users are able to request the information they need.</td>
<td>Many people need to have access to the SRS to facilitate their work for the university, but they have not been given the priority.</td>
<td>Nobody coordinates these requests to say whether it can be provided, and what level of access is allowed</td>
<td>Technology should be made to serve the human requirements not the other way round. Be more flexible to the key staff who need to access the SRS for doing a better job.</td>
</tr>
<tr>
<td>20. Non-standard courses do not fit into the SRS.</td>
<td>The system does not enrol students who commence their study programmes I April until September of the following academic year. As a result, references provided to students are unreliable in terms of study dates and also these student numbers will not be included in the previous year's HESA returns. Different procedures exist for dealing with different non-standard programmes. These processes are not written down and are created in an ad hoc fashion. An inflexible system is trying to accommodate variable processes.</td>
<td>Lack of flexibility in the SRS, and as a result, the Business School was advised to withdraw the students from the programme for the academic year 1998/9 and enrol them for 1999/2000 so that it would be possible to print the examination board reports for the cohort.</td>
<td>It should be part of the validation process to consider how non-standard courses be administered in relation to the SRS.</td>
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<td>Problems</td>
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<td>21. Information on a student’s financial standing is vital but was often wrong or not accessible on the SRS.</td>
<td>It does not tell the user if the student is a debtor or has a history of debt. Staff often received queries about fees from part-time and postgraduate student. The International Office received invoices from agents who receive 10% on the student’s first year’s fee. The International Office had to send a request to Student Administration to get a breakdown of what has been paid and whether the student has arrived. This is an unnecessary delay.</td>
<td>Lack of information provision. Bureaucratic phenomena. Every time somebody changes a module on the SRS, it complicates the student ledger. The staff who enter data and change modules do not realise the impact of their actions.</td>
<td>Link the Finance system with the SRS. It would be useful to investigate the problem on site rather than to refer to Finance. Provide key university Staff with access to Srs fee information. Information about invoices and credit notes raised and payment received to be available. If fee information is wrong, then it should be investigated and corrected as soon as possible.</td>
</tr>
<tr>
<td>22. Problems were caused over the summer of 1999 with Quality Assurance clearing up programme codes.</td>
<td>The courses disappeared from the system and student numbers fluctuated. There was no one person overseeing the system so it was not clear who to inform that would take responsibility.</td>
<td>Lack of communication between different sections of the Uni. Quality Assurance should have communicated with the faculties and ACS, or vice versa. There are a variety of data inputters and no coordination.</td>
<td>The SRS needs to be tested before it goes live or is needed for examination boards. Coordinated by ACS, the Uni should introduce census dates and provide more opportunities for the user management group to check and correct the data.</td>
</tr>
<tr>
<td>23. There is little verification on the system</td>
<td>It is necessary to enter a student’s study mode three times, so there are some students who are recorded on one screen as f/t and on another as p/t. There are also examples of students recorded as being LEA funded and employer funded. As a result duplicated student numbers appear in reports. It was unclear whether undergraduate students were required to show proof of their qualifications. Information is duplicated on different screens which increases the likelihood of problems.</td>
<td>Lack of information specification and presentation. Such errors at data entry level generate additional work as each record needs to be corrected manually on an individual basis.</td>
<td>Improve the input and output of the SRS. It should not be possible to enter conflicting information.</td>
</tr>
<tr>
<td>24. Academics are not or do not want to be engaged with the SRS.</td>
<td>They do not want to be caught in a complicated process of obtaining a password. They relay on their department administrators for the information from the system. The SRS is said not user-friendly.</td>
<td>A standard set of reports should be identified that meet the needs of the academic staff if possible. A new SRS must be flexible in terms of output and reporting and provide the opportunity for Staff to personalise their own reports. If reports are from ACS, they should be sent electronically to allow users to format the data to suit their needs.</td>
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<td>25. Students normally receive standard letters regardless of their programmes of study.</td>
<td>To find basic information such as the student’s address it is necessary to tab through the whole of the first screen. If there is any information missing from this first screen, the user will not be able to pass the data field. The length of time it takes to get amendments to reports is a problem. No statistical output was provided which makes it impossible to produce an annual report.</td>
<td>Lack of selectivity for the distribution of results.</td>
<td>Improve the customer focus of the University’s services by providing timely and relevant information.</td>
</tr>
<tr>
<td>26. The user has to go into a number of different screens to obtain the information required.</td>
<td>The system was not user friendly. It was set up without consulting the users’ needs analysis.</td>
<td>Provide core information on a student on one screen in summary form. Consult with users on information required. Provide users with comprehensive, intelligible and accessible information.</td>
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<tr>
<td>27. The SRS is often inaccessible.</td>
<td>The SRS often crashes and is slow during busy periods such as end-of-the-term examination boards. It often takes a long time to print the reports for the examination board, and information is often missing. In Humanities internal exam boards had to be postponed as synoptic reports were not available in 1999.</td>
<td>The net work is down, too many users, or there is a problem with the printer. Not enough testing of the SRS</td>
<td>Size the systems in terms of hardware and software and evaluate them against predicted level of use. Provide multiple log-in facility to all faculty administrative staff.</td>
</tr>
<tr>
<td>28. Information is unavailable or inadequate for assisting with teaching or modules, managing programmes and producing annual monitoring reports</td>
<td>It takes too long for users to obtain a password for the system.</td>
<td>Lack of consultation with users. Fail to recognise that system administration is an administrative and not a technical function.</td>
<td>Develop a standard set of reports with users from across the University to meet changing requirements. Improve the utility and accessibility of academic management information. Review the system for allocating access to the SRS.</td>
</tr>
<tr>
<td>29. It is unclear from the titles on the print menus the information that each report provides.</td>
<td>No system documentation. Unable to view report information on screen before printing.</td>
<td>Amend report titles to more accurately reflect content of report. Produce a manual which provides a summary of each report.</td>
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<td>30. There are many local systems within the university that seem to work in isolation and do not feed into the central SRS.</td>
<td>Students may tell the Alumni Department their new address and employment details, faculties receive up-to-date contact information from Sts for graduation and lecturers have information about graduate employment but the majority of this information does not get fed back to the Careers Service for their First Destination Survey.</td>
<td>Sharing of information was felt to be problematic.</td>
<td>Necessary definitions should be provided with all reports to avoid potential confusions. The Centre needs to produce basic sets of information that are accurate. Local users can then manipulate this data as they see fit. They can input all relevant information as received.</td>
</tr>
<tr>
<td>31. Courses were re-coded by QA without any consultation (year 99/00), as a result codes for the same course and sometimes even for the same level duplicated.</td>
<td>One report used two different codes and two different programme titles for the same course at different levels: a/ PAL-HND! Public Administration (Legal Studies). B/ PAL-HND Public Administration (Legal Pathway). This caused huge problems when printing examination board reports.</td>
<td>No consultation and no formal notification that codes had been changed.</td>
<td>Repeated modules could be designated differently in different semesters, for example, by adding S1 or S2 at the end of a module code.</td>
</tr>
<tr>
<td>32. There is often no explanation provided for the codes that are used in reports.</td>
<td>The 3 reports, which LBS received purporting to provide enrolment figures early in Nov 1999, showed that LBS had a range of 450-600 Sts depending on which report was consulted.</td>
<td>No clear definitions on whether the totals are for FTEs or actual student total numbers or whether Sts on combined programmers or franchise Sts are included.</td>
<td>What is needed is a summary screen which provides basic information on every St, including those Studying here during last few years, such as name, address, programme and level of Study. This screen needs to be user-friendly, easy to understand and accessible to all users.</td>
</tr>
<tr>
<td>33. Problems were caused in year 99-00 by automatic enrolment on core modules.</td>
<td></td>
<td>Nobody asked whether it would work or tested it before students enrolled.</td>
<td>Enter the Mid-semester assessment grades onto the system as soon as they are available.</td>
</tr>
<tr>
<td>34. It is not possible to check the progress of a student mid-semester.</td>
<td>Staff cannot access such information from the system. They are not sure how much effort they should make to provide ongoing support to students throughout the academic year.</td>
<td>Mid-semester assessment grades are not entered on the system until the end of semester.</td>
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<td>Problems</td>
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<td>35. The SRS only records the current status of St. So it is not possible to access a student's progression decision for a previous year or a graduate’s final degree classification.</td>
<td>There is not a report on the current print menu of the SRS which provides information on Sts for previous years.</td>
<td>Progression decision and final degree classification is not included on a student's printed transcript.</td>
<td>Access to the progression decisions and final degree classifications of students on screen. The system should provide a complete 'fresh to graduate' student record.</td>
</tr>
<tr>
<td>36. There are conflicts between the university’s physical systems and its information system.</td>
<td>There is a growing view that all faculties should keep their own statistical information about their student body as it is not possible to obtain statistics from the SRS.</td>
<td>Sts register on modules too late to enable module lists to be produced early enough for proper planning and allocation to tutorial groups. And it is difficult for 1st year students to choose their modules in advance.</td>
<td>The SRS should be able to record enquiries. It would be useful for the Centre to attend examination boards to see the problems experienced. The university should listen to the views of the users and be realistic.</td>
</tr>
<tr>
<td>37. There is no overall management or ownership of the SRS and users are unclear where to go for assistance.</td>
<td>With a system problem, it is often a guessing game about whether it is ACS or Networks. There is not a systematic approach and over time this causes problems. It is not clear where or how many places students should go to change their address details. Different levels of user access exist for the SRS, but it is not clear who determines the level of access and what the levels are.</td>
<td>A Help Desk pro forma for queries is accessible on the university’s web page, but the majority of users didn’t know about it. Complaint and appeal information is not shared.</td>
<td>Clarify the ownership to move away from the blame culture. Provide a list of contact names for specific problems with the system. Inform people of the reporting system. Create links between the central system and other key system such as finance and personnel. Allow students to log onto the SRS and check their own details and enable them to change their address at their 1st point of contact within the university.</td>
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Appendix I

More Comments on the Student Records System

1. *The system produced incorrect information.*

Typical examples were:

- At examination boards there was always a high number of students recorded as ‘non-attempts’, but where these students not had in fact attended the modules listed.
- The SRS reported that students had not submitted a piece of work, but where the students were able to produce a receipt of the work having been done.
- Students contacted the university when they received standard letters regarding absence to say that they had graduated several years previously.
- Students replied to a mail shot that was distributed about poor attendance saying that they had never enrolled at the university.
- Information was sent to students at the wrong addresses, to students who had withdrawn from the university, and to those who had never commenced a course.
- Students were incorrectly enrolled on modules in the wrong semester.
- A record for a staff member said he had not completed his course, though he had been awarded his degree the year before.
- Reports provided for examination boards often contained many errors, and thus had to be gone through individually to make sure the information was accurate.
- Incorrect information was provided about course fees, when the course began, and how and when a part-time student could enrol. For example, the module fee for year 99/00 increased from £125 to £128, but this was not changed on the system, so students were enrolled for the wrong fee.

2. *The system produced ambiguous, or unsatisfactory information.*

Typical examples were:

- There was no distinction provided on the system between a fail for a referral student who submitted work of poor quality, and a fail for non-submission.
- It was not clear how many assessment points there were for a module or which modules were core.
• It was not possible to check the progress of a student mid-semester.

• The system did not state in an easy format whether a student was studying a single, major-minor, or joint programme, or the level at which a student was studying. There was no cross-referencing to record whether a student was repeating a module or whether they were carrying grades forward.

• One record showed a student with 75 credits at level one, 120 credits at level two and 120 credits at level three. It was not clear how he could have been allowed to progress in level two.

• The SRS was not able to prevent more than 8 modules being entered for a student, and one student was found to have enrolled on 17 modules!

• There were some students who were recorded on one screen as full-time, and on another as part-time, and those who were recorded as being both LEA funded and employer funded. As a result duplicate student numbers appeared in reports.

• LBS received three reports purporting to provide enrolment figures early in November 1999, where these showed a range of 450-600 students depending on which report was consulted.

• Fee-waivers were completed for research students on bursaries but these students received repeated invoices.

• One student who changed her name after she got married had two student records – one which said that she had failed and the other awarding her an honours degree.

• Domicile and nationality were sometimes thought to be the same thing.

• Serious problems were caused over the summer of 1999 with Quality Assurance clearing up programme codes. Some courses disappeared from the system, and student numbers fluctuated. Problems were also caused in the same academic year by automatic enrolment on core modules.

3. The system failed to provide sufficient information about the student.

Typical examples were:

• The student's degree classification did not print on the final transcript. It was also not possible to access the classification result of a student from a previous year on the SRS. Staff had to refer to paper-based examination board reports to write references for students.

• It was not possible to obtain information about a whole cohort of students on a programme. And very often the basic information about the current status of the
student was not available. For instance, whether they were current, withdrawn, or completed; home or overseas, what the weightings were for each assessment, and the number of assessment points, whether the student was taking each module as a core, option or elective; whether the student numbers were FTEs (full time equivalents) or active students.

- The system was unable to cope with repeated modules and it was not evident at which level the student joined the University.
- The system was not able to produce tutorial lists for modules to track attendance. It was also not possible for lecturers to monitor the progress of students throughout the semester.
- The system did not tell the user if the student was a debtor or had a history of debt.
- LBS staff often received queries about fees from part-time and postgraduate students, because this information was not made available to students.
- The International Office (IO) received invoices from agents asking for the 10% on the first year’s fee of the students whom they helped with the recruitment. However, such a process was often unnecessarily delayed because the IO had to send a request to Student Administration to get a breakdown of what had been paid and whether the student had arrived.
- There were no records of historical students; as a result, the university often lost touch with international graduates.
- No information was carried about a student’s other qualifications, age, ethnicity, etc. And it was not possible to keep a record on the SRS of maternity or long-term sickness breaks.
- Details of A-level points had often not been entered (although inferences could be made from the level of modules that a student is taking) and the undergraduate classification of a postgraduate student was not recorded on the system.

4. The system failed to provide information required for some key academic activities

Typical examples:

- Information on the system such as HESA (Higher Education Statistics Agency) returns was not made available to staff from the system.
- It was not possible to record information about external examinations that a student had taken.
- The SRS did not hold information on non-standard courses. The system did not enrol students who took their study programmes from April to September of the following
academic year. As a result, LBS was advised to withdraw the students from the programme for the academic year 1998/99 and enrol them for 1999/2000 so that it would be possible to print the examination board reports for the cohort.

- The SRS could not be used by some departments of the university, such as the LCB (Language and Culture for Business) or the University's Research Centre, for any purpose other than the generation of an ID number. For the Research Centre, the statistics needed for the annual report (to the University Research Degrees Committee) on completion rates, the length of time needed for a PhD, withdrawals, transfers, etc had to be calculated manually. And there was no information from the system about the research grants that the university received and details about how much, who for, and from whom.

- The SRS was often not updated soon enough to produce students' reports. As the system failed to produce proper presentation of the assessment information for external examiners, Luton Business School had to design a spreadsheet to enable graphs to be produced.

- Module numbers and lists were provided too late to assist with timetabling and production of lecture materials.

- Accurate information on progression rates was required for the Annual Course Monitoring reports, but this had never been provided. It was necessary for the Field Manager to use the examination board reports to calculate the information on progression manually.

- The availability of pass rates after referral was not updated early enough after the referral examination boards, and an overall decision was not recorded when a student had a referral in an assignment and an exam for the same module and they passed one element and not the other.

- Some students were randomly omitted from examination board reports.
5. The system failed to record core data required for HESA\(^3\) returns, HEFCE\(^4\) research, and subject review.

Typical examples were:

- A-level points and occupational codes were not available on the system.
- When making returns to HEFCE the number of students included on the return and recorded on the SRS did not match.
- Basic information such as 'unit of assessment' which had to be included in the return to HEFCE was not recorded.
- Offers were made on to combined courses under the general UCAS code Y400, but the full name of the courses to be combined were not listed in the appropriate fields.

6. The system was sometimes difficult to use, or failed to work.

Typical examples are:

- The user sometimes had to go into a number of different screens to obtain the information required. It was not possible to view report information on the screen rather than printing a report.
- In places presentation on the screen was poor and it was difficult to move between the various screens.
- The SRS often crashed and was slow during periods such as exam boards. And it often took a long time to print the reports for the examination board, and information was often missing. In year 98/99, the synoptic reports were not available for the internal examination boards, and in Humanities, the internal boards had to be postponed.

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\(^3\) Higher Education Statistical Agency

\(^4\) Higher Education Funding Council for England
### Appendix J Ethnography I: Records of Interviews

(Between September 1999 and June 2000)

<table>
<thead>
<tr>
<th>Ref. No.*</th>
<th>Post held</th>
<th>Interview Date</th>
<th>Starting Time</th>
</tr>
</thead>
<tbody>
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<td>ISD-992034</td>
<td>Deputy Librarian, Library System</td>
<td>02-11-99</td>
<td>8.45am</td>
</tr>
<tr>
<td>ISD-992035</td>
<td>Associate Dean, Corporate Affairs</td>
<td>04-04-00</td>
<td>3.45pm</td>
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<tr>
<td>ISD-992036</td>
<td>Researcher, Humanities</td>
<td>04-10-99</td>
<td>1.00pm</td>
</tr>
<tr>
<td>ISD-992037</td>
<td>Researcher, Human Resources</td>
<td>05-01-00</td>
<td>1.00pm</td>
</tr>
<tr>
<td>ISD-992038</td>
<td>Co-ordinator, International Stu. Recruitment</td>
<td>05-05-00</td>
<td>2.30pm</td>
</tr>
<tr>
<td>ISD-992039</td>
<td>Student, EFL</td>
<td>05-11-99</td>
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<tr>
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<td>Head of Dept, Human Resource</td>
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<td>Head of Humanities</td>
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<td>Associate Dean-Research</td>
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* To preserve the privacy of the interviewees, their names are hidden.
Appendix K

Other Comments from Ethnography I

Section 7.6 summarised the main issues identified from the researcher’s direct involvement in the process of an institutional information strategy development and from interviews using Ethnography. Other comments from this research are listed below:

1. The main purpose of the SRS is a database of students which should keep an accurate record of every student registered, what they have achieved in the past and what they are doing in the present. The system is not even running as a database at the moment. The statistics will not mean anything until the system is running properly. This should be the University's priority, until then any information taken from the system is unreliable.

2. It was ridiculous that a new system was purchased and it was not tested before it went live. The system should have been used alongside the current system for a significant period of time. Instead the system was employed on the first day that international students arrived for enrolment.

3. The new EMIS screens are easier to use than the old HEMIS system but people need to be trained to complete all the data fields to include all the information from the application forms at the time of enrolment as opposed to going back at a later date to enter missing data. If the data fields were completed correctly then the system would work really well, e.g. if a student’s email address is entered it can be possible to send an email to that student just by clicking on the address. The people who enter the data can be lazy and only complete the basic information. There are no parameters to stop people from leaving out information. Somebody needs to explain the importance of this to the staff during training.

4. The new EMIS admissions software provides an audit trail of everything entered on the system. It lists when information was entered and by whom so incorrect offers can be traced to a person. It keeps a record of all information
sent to a student. There is a standard letters package and it is also possible to run a bulk update of a standard letter. The new system has made a tremendous difference in terms of the operation of the Admissions Department.

5. It has taken a year to overcome the problems experienced with the new system but it is still slow. With HEMIS, one hundred offers from information downloaded from UCAS could be made in a relatively short period of time. Staff who are inputting the data into EMIS now have to go into three different screen to generate an offer which has slowed the process considerably.

6. The new EMIS system has a separate qualifications package which includes information on A-level qualification transferred from UCAS. It was possible to call up a student and view their A-level results but it was not possible to transfer this information across to the SRS. In the past, details of qualification or any further details such as A-level points were not entered.

7. A major problem is having to use different systems for different function, namely EMIS for admissions and HEMIS for the SRS.

8. The information required to teach modules/manage programmes/produce annual reports is present on the system but there is a question of accessibility and it is not clear how to produce a non-standard report. It is also not clear who is responsible for providing data.

9. The Clearing screens do not bring up duplicate records. EMIS does pick up duplicates but allows the user to make a duplicate record even though it provides a warning that a duplicate may exist. The system should stop the user from making an offer if a duplicate exists. On the new clearing screens there is not a field to enter A-level points although this was present on the system used in year 98/99. The user must ask the applicant for this information but there is nowhere for it to be recorded which is a major problem. So SCS needs to customise the software to provide a mandatory field.

10. There is no clear ownership or management of the system. The SRS should be managed by a separate group within Quality Assurance. Quality Assurance is the logical place for information required for Subject/Department Review to reside.
11. The SRS is extremely badly structured, badly operated and there does not seem to be any clear management of the SRS. The incorrect input of information is not a major issue. It is the poor quality of the SRS itself that is the problem.

12. The HESA return should be used to provide information on the cohorts of previous years. Information should not be obtained from the SRS. For the current year, any information used should be consistent with the information that will be sent to HESA and this should be obtained from a central source. Subject/Department Review should not use figures that are inconsistent with the HESA return. At any time it should be possible for a member of staff to print a HESA extraction from a database.

13. The change to the university marking scheme for a 16 point scale to percentages should be introduced gradually with the level one cohort first and then following through into subsequent years as this cohort progresses. Students transcripts will be confusing if there is a mixture of percentages and 16-point scale.

14. No training or support is provided centrally. The Faculties provide in-house training on an ad hoc basis for new staff members. Too many temporary staff input data. There is missing and incomplete data entry at the enrolment. It is not the SRS that is at fault, it is the quality of the input. Data entry is currently anonymous and the introduction of a signature against entry was thought to be a means of making people accountable. The university should consider alternatives to the employment of temporary staff. There needs to be less staff who are paid more and who receive adequate training. The errors made at point of input have huge implications and data entry needs to be treated as a more serious exercise by the University.

15. There needs to be a clear split between the people who specify the information and the people who provide it.

16. For the SRS to work, the systems that inform it need to work properly. The counselling of students who receive a ‘Negotiated Progression’ decision is a good example of how the system can be corrupted if students amend the module choice form once it has been authorised.
17. Sts should be automatically enrolled on core modules. It is a waste of time to make these students complete a Module form (MODS1) and have to queue to enrol on modules. It simply increases the scope for errors.

18. For the Subject Review document of year 99/00, the Faculty Registrar of Science, Design and Technology tried to compare the faculty's ethnicity and gender base with the university rates. No one knew where this information could be obtained, not even the Student Services. This is basic information. Modules reports should state whether these students are full-time or part-time, home or overseas. Profiles of students giving race, age and gender in particular could benefit many areas in the University's teaching.

19. There should be a workshop for key users to identify what is needed, what is missing and set priorities for the coming year.

20. There is an abuse of the 'alert text message' so staff no longer rely on this source of information.

21. The student email facility should be more utilised for communication for teaching and learning. It is surprising that some part-time students do not have access to the University's e-mail facilities. The university is missing an opportunity of communicating with its students on a more regular basis.

22. It is not clear where students need to go to give notice of withdrawal from a module or of change of address.

23. Many of the problems with the student record SRS are thought to be technical, so a technical solution is proposed. This does not work as often the problem lies elsewhere maybe with the culture of the university and a holistic approach to the problem needs to be taken. There should be less apportioning of blame and more done to get the SRS to work.

24. The way that the university approaches SRS problems is completely wrong as it takes a narrow SRS point of view rather than an overall view. It fails to see the way people relate to each other and the cultural problems and barriers that exist. Abandoning the SRS and starting again would be foolish unless the present SRS runs in parallel.

25. The university could make the SRS more reliable if problems with people in the system were properly addressed.
26. We will never be able to get rid of human error so we need to adapt and introduce more validation and preventative measures with the SRS.

27. American universities employ institutional Statisticians and have whole departments who do research on their Sts. The university should utilise its existing resources in terms of lecturers who could produce research on student behaviour or who could use the table data in the SRS to produce more reliable information.

28. There is no validation process to stop mistakes from happening or to identify mistakes that have been made.

29. A large knowledge base (about the SRS) is held in the heads of certain key numbers in the University. If the University lost these Staff, the knowledge of what the SRS can do will also be lost. So the University needs to tap into this knowledge base before these Staff leave. Knowledge is taken for granted by these people.

30. Lecturers being able to access and print their own module lists would be useful.

31. Different pieces of information are required by different users at different times but somebody needs to be coordinating the requests. At the moment, he who shouts the loudest gets the result. For the faculties, 'Subject Review' is the priority but who is to say that Subject Review is more important than producing accurate fee information to students.

32. If students fail to pass the exams and then return the following year the 'Progression Decision' needs to be changed to reflect the student's extended programme otherwise the progression statistics make little sense.

33. Things are the wrong way round when the Centre design forms for the academics to use. The users of the information should be the ones to specify the information that is needed and the format. There should be more consultation to provide the Centre with the views of the users.

34. Computer- Based Assessment results are not provided in a format that suits the course team's requirements. The course team are provided with an Excel file but this lists the grades in percentages which then need to be converted into the university's 16 point grading SRS. Students are listed by ID number
and the first four letters of their name which requires extra effort on the part of course team to produce an alphabetical listing of students by surname.

35. Faculties should be responsible for enrolling their own students because they have an understanding of how the courses operate. The process should be managed and audited centrally and training provided.

36. Details on the placements, sickness and annual leave of nursing students are not available. Recording the continuous assessment grades for nurses are difficult.

37. The module lists should be used to help with the production of timetables but the information is received too late.

38. With the credit accumulation scheme, progression is not a reliable indicator any longer as fail students are allowed to continue. Course teams need to know the number of students who graduate, the number of students who do not return, and the number who carry on in some form or other.

39. The annual monitoring process has become a meaningless exercise because of the lack of availability of statistical information.

40. Presentation is also important. The University should be concentrating on producing information in a format that everybody can understand.

41. It was not clear whether lecturers are allowed to access the SRS. Some lecturers in some faculties had read-only access, but not in the Business School. So it was not clear it was a Business School decision to deny lecturers’ access or whether staff had simply not been informed that access was available.

42. St advisors agree with ‘Negotiated Progression’ students a list of modules which they should be enrolled on. The student then takes the MODS1 form away. This introduces the opportunity for students not to enrol or to alter the data. It would be useful if the student advisors could take responsibility for entering the date.

43. Students are randomly omitted from examination board reports and it is not clear why this happens.
44. There is a culture within the University to be responsive and to always accommodate a range of issues but this is often at the expense of getting the SRS accurate for the majority.

45. Nobody manages the Alert Text facility and once text is entered it is seldom updated or removed.

46. The University needs an Alumni Officer. Opportunities are being missed by the university, e.g. overseas Alumni could help with international recruitment fairs.

47. The information required for Subject/Department Review should reside in a statistical office based in ACS which is managed by a statistician whose responsibility it is to provide basic data sets and an information service. It should be this person's job to provide users with regular updates.

48. The University should take one step at a time and not make extravagant promises, as this is merely an excuse for inaction.

49. One of the major complaints about the University was how slow the University was in responding to requests for a prospectus.

50. There are problems with communication between Networks and ACS. A faculty not having access to a printer for a whole week is not acceptable.

51. Exam duration is not listed on the system because there are no free fields. This would assist greatly with the production of the exam timetable.

52. Managers, particularly the Faculty Registrars, should possess an understanding of how the system operates.

53. The failings in the human systems that run parallel to the SRS must be recognised, e.g. Student Administration (SA) set the fee for a module against a particular semester. When faculties change the semester for that module and inform Quality Assurance (QA), a form is completed and then sent to the Modular Office (MO) to amend the module details and then on to SA to change the fee information. This information often remains with the MO for a while and arrives with SA too late. This results in invoices being issued that are incorrect and faculties receiving incorrect modular income. Student Administration should be able to print an exception report that says a new
module has been created and does not have a fee set up. Four different areas have a function when changing a module's semester.

54. All module leaders should be using electronic module lists instead of paper-based lists.

55. Inadequate systems are worked around too much.

56. The design of the MODS1 and the Mod-change form should be reconsidered in consultation with the users. There are different versions of the forms available in different parts of the University.

57. To the question 8 "who should specify what data/information is needed and in what form it is presented", one answer is: the users and the information specified by HESA/Subject Review.

It was agreed that user requirements were crucial and critical. Regarding the software modules, there were complaints about what had been purchased (enquires, admissions, and enrolments) as no demonstration had been conducted before the purchase, and as a result they failed to meet the need of the potential users. It was decided that the modules not purchased (e.g. ID card revising system) should be demonstrated to relevant personnel from different Faculties/Departments before any purchase decision could be reached. ‘Ensure what you buy (the system) matches what you want’ (ISSG Minutes, 28/01/99). It was also found important to define key individual users, and it was mentioned that the budget of the University should be considered.
Appendix L

Questionnaire for Ethnography II (not used)

To Whom it May Concern

I am a PhD research student at the University of Luton. My research topic is: Developing a framework for evaluating information strategies in HEIs. I am currently collecting data for my research. To help me gather information on the topic I would appreciate it if you could spare a few minutes to complete this questionnaire. Your opinion will be highly valued. However, all data will be handled confidentially with any comments used being on an anonymous basis.

If you have any questions regarding this questionnaire or the dissertation topic please do not hesitate to contact me. My contact details are:

E-mail: yong.nie@luton.ac.uk
Tel. No. 01582743194
Address: Department of Finance, Systems and Operation
          Luton Business School, University of Luton
          Park Square, Luton, LU1 3JU

Kind regards,
Yongmei Nie
Please tick the right answer(s), and/or write your answer where appropriate. For some questions you can choose more than one answer.

1. Are your library and computing centre....?
   A. independent  
   B. converged under one manager  
   C. strategically directed by one Pro Vice Chancellor  
   D. other (specify) ...................................................... .

2. How are your IT resources controlled and managed?
   A. By centralised information service.  
   B. By individual departments, faculties or schools.  
   C. Other (specify) .................................................... ..

3. If the IT resources are controlled and managed by individual departments, faculties or schools, which faculties and departments have the most of such resources?

4. What level of IT training do you provide for?
   Please indicate a number for each category, from 0 (none) to 5 (compulsory).
   A. Undergraduate Students:  
   B. Postgraduate Students:  
   C. Research Staff:  
   D. Teaching Staff:  
   E. Administrative Staff:

5. Do you 'enable' students to gain access to PC's by (more than one response may be chosen):
   A. Heavily invest in centrally provided PC provision.  
   B. Provide 24 hour access to machines;  
   C. Loan PCs to students  
   D. Other (specify) ....................................... .

5. Are dial-in facilities available for any of the following groups wishing to telework (remote access)?
   A. Research Staff  
   B. Administrative Staff  
   D. Students

6. Is centrally held information duplicated at departmental level?
   A. Yes (Please Specify the reason)  
   B. No.

7. Does your institution already have a documented IT strategy?
   A. Yes .  
   B. No.

8. (If you have answered “No” to Question 7) Is your institution developing an Information Technology Strategy.
   A. Yes.  
   B. No.

9. Does your institution already have an Information strategy document as distinct from an IT strategy?
   A. Yes.  
   B. No.

10. (If you have answered “No” to Question 9) Is your institution thinking about developing an Information Strategy?
    A. Yes.  
    B. No.
11. (If you have answered “Yes” to Questions 9 & 10) Please briefly outline what your reasons were/are for developing an information strategy.

12. Who initiated the information strategy in your institution (i.e. who introduced the idea?)

   Name:  
   Position:  

13. Is the strategy being produced by (more than one response can be chosen):
   A. A Committee  
   B. The Director of Computing Services  
   C. The Chair of the IT Committee  
   D. A Pro Vice Chancellor  
   E. Another member of the senior management  
   F. Other (specify)  

14. (If you have chosen “A” for Question 13) Are the committee members .......?
   A. appointed  
   B. drawn from a wide basis within the institution  
   C. elected  
   D. drawn from people who are seen as experts  

15. Which of the following areas are represented on the strategy committee?
   A. Students  
   B. Academic Staff of different faculties  
   C. Finance Director  
   D. Computing Services  
   E. The Library  
   F. The Administration  
   G. Media Services  
   H. Marketing  
   I. Estates  
   J. Research and Business Services  
   K. Other (specify)  

16. Do you have a separate implementation committee for the strategy?
   A. Yes.  
   B. No.  

17. (If you have answered “Yes” to the above question) What is the name of the implementation committee?  

18. Who or which group does the Information Strategy Group report to?  

19. Is any individual regarded as the main proponent for the principle of an information strategy?
   A. Yes  
   B. No  

20. (If you have answered “Yes” to Question 19) Who is this person?  

21. What are the key issues that have been raised during the development of an Information Strategy?  

22. How would you describe the process so far? Scale 1 (highly) to Scale 5 (not at all).
   A. Productive  
   B. Useful  
   C. Time consuming  
   1 2 3 4 5  

23. Which statement most accurately represents your belief about the development of the information strategy?
   A. At the end of the day it is the document that matters.  
   B. It is not just the document, the process is also important.  
   C. It is the formal mechanism for facilitating communication with people in other departments, faculties or schools that I find most useful.  
   D. Other (specify)  

24. How long is your information strategy planning cycle?
   A. Within one year
   B. One to two years
   C. More than two years
   D. It is an iterative process

25. Is the information strategy explicitly linked to………?
   A. Institution’s Strategic Plan
   B. Teaching and Learning strategies
   C. Academic strategic plans
   D. The IT strategy
   E. Financial strategies
   F. Human resource strategies
   G. Estates strategies
   H. Other (specify)

26. How would you typify the relationship between the library and the computing centre during this process of information strategy formulation? (Please indicate with a number for each, from 1 - high Level to 5 - low Level).
   A. Conflict: 1 2 3 4 5
   B. Communication: 1 2 3 4 5
   C. Co-operation: 1 2 3 4 5
   D. Change: 1 2 3 4 5

27. Have any methodologies or models been used in the process?
   A. Yes
   B. No

28. If you have answered “yes” to the above Question, what methodologies have been used?

29. Has any ‘outside help’ been brought in to aid in the development of the information strategy?
   A. Yes
   B. No

0. If “yes”, which one?
   A. Consultants
   B. Government bodies
   C. JISC
   D. Other institutions
   E. Other (please specify)

31. Could you please briefly elaborate upon their role in the process?

32. How radical do you /did you expect the impact of an information strategy to be on your institution? From Scale 0 - no impact to scale 5 - Very radical
   1 2 3 4 5

Thank you for your kind assistance and contributions.
Appendix M

Contact List for Ethnography II (Participant Observation at JISC Workshops and Conferences)

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<th>Position held</th>
<th>Institution</th>
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<td>Deputy Librarian</td>
<td>Birkbeck College</td>
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<tr>
<td>PO-992078</td>
<td>Web Editor</td>
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<td>PO-992079</td>
<td>Project Officer, Planning and Communications Systems</td>
<td>Brunel University</td>
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<td>Systems &amp; Database Management Librarian</td>
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<td>Head of Learning Resources</td>
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<td>Director of Library Services</td>
<td>Kings College of London</td>
</tr>
<tr>
<td>PO-992085</td>
<td>Director of Information Services and Systems Systems</td>
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Appendix 9.1 Samples of Communication with the University of Hull for Case Study Interviews

Sample I: Contacting Director of Academic Services by E-mails

From: "Richard Heseltine" <R.G.Heseltine@acs.hull.ac.uk>
To: "yong.nie@luton.ac.uk" <yong.nie@luton.ac.uk>
Subject: RE: (Fwd) Ref: Information Strategy at the University of Hull
Date: Tue, 3 Apr 2001 11:56:33 +0100

Dear Yongmei Nie

Richard Heseltine has asked me to respond to your email regarding your visit to Hull later this month. He is available on the morning of 24 April if you would like to come to his office in the Brynmor Jones Library at 9.30 a.m.? Let me know if this is not convenient.

Margaret Elliott
Academic Services Secretary
University of Hull, HU6 7RX, UK
Phone - +44 (0)1482 465201
Fax - +44 (0) 1482 465531
e-mail margaret.elliott@hull.ac.uk

-----Original Message-----
From: Yongmei Nie <ynie@Galaxy.luton.ac.uk>
To: r.g.heseltine@lib.hull.ac.uk
Subject: Information Strategy at the University of Hull
Send reply to: yong.nie@luton.ac.uk
Date sent: Wed, 28 Mar 2001 18:39:36 GMT

Dear Richard

I am a PhD student at the University of Luton. I think we met at one of JISC's Conferences in London last year, and we had a brief discussion about information strategy at your university. We also talked about the possibility of my contacting you for further information about this strategy.

The topic of my research is 'Formulation of a Framework for Evaluating Information Strategies in Higher Education Institutions'. My internal supervisors are Dr. Steve Clarke and Professor Brian Lehaney, and my external supervisor is Professor Michael Jackson from the University of Hull.

As part of this PhD, I am in the process of devising an 'evaluation framework' intended for use by practitioners to assist in the evaluation of information strategies in HEIs.
Since the University of Hull is one of the pioneering institutions with an information strategy, and also one of JISC's pilot sites, I think it would add great value to my research if I could make an initial trial of my framework, with the idea of refining it, with reference to the information strategy that has been implemented at your university.

My supervisor - Dr. Clarke, will be visiting the University Hull from Monday 23rd to Wednesday 25th April on academic business, and it is proposed that I take advantage of travelling with him, with a view, if possible, of my having preliminary discussions at Hull about how such a trial of this framework might proceed.

The purpose of this e-mail therefore is to ask if you might be available, and be willing, to have an initial discussion on this topic sometime on Tuesday 24th April or Wednesday morning 25 April (I will be in Hull from late afternoon of Monday 23 April to lunch time Wednesday). If this is not possible, would you be able to suggest anyone else who also has a fairly good overview of Hull's Information Strategy who might be available for discussion?

The purpose of these meetings is not to try out my proposed framework in detail, but mainly to gain ideas and to have initial discussions of what might be the best way forward in terms of the development of an effective framework for evaluating information strategies in HEIs.

If such meetings are possible, with yourself and possibly with others, may I please ask you to let me know what is convenient, in terms of who it might be possible to see and when they might be available, and their contact details if relevant.

Any assistance you can give me on this matter would be very much appreciated.

Yours sincerely,

Yongmei Nie

Luton Business School
University of Luton
Park Square, Luton, Beds. LU1 3JU

Tel: 01582-743194 (w)/01582-750819 (h)
e-mail: yong.nie@luton.ac.uk


**Sample 2: Contacting Information Manager by Post**

Dear Marilyn

I am a PhD student at the University of Luton. Perhaps you may remember me; we met at JISC’s Information Strategy Conference last December in London. After your presentation on that day, we had a brief discussion about information strategy at your university. We also talked about the possibility of my contacting you for further information about this strategy.

The topic of my PhD is 'Formulation of a Framework for Evaluating Information Strategies in Higher Education Institutions'. My internal supervisors are Dr. Steve Clarke and Professor Brian Lehaney, and my external supervisor is Professor Michael Jackson at Hull.

As part of this PhD, I am in the process of devising an 'evaluation framework' intended for use by practitioners to assist in the evaluation of information strategies in HEIs.

Since the University of Hull is one of the pioneering institutions with an information strategy, and also one of JISC's pilot sites, I think it would add great value to my research if I could make an initial trial of my framework, with the idea of refining it, with reference to the information strategy that has been implemented at your university.

My supervisor - Dr. Clarke, will be visiting the University Hull from Monday 23\textsuperscript{rd} to Wednesday 25\textsuperscript{th} April on academic business, and it is proposed that I take advantage of travelling with him, with a view, if possible, of my having preliminary discussions at Hull about how such a trial of this framework might proceed.
The purpose of this e-mail therefore is to ask if you might be available, and be willing, to have an initial discussion on this topic sometime on **Tuesday 24th April** or **Wednesday morning 25 April** (I will be in Hull from late afternoon of Monday 23 April to lunch time Wednesday). If this is not possible, would you be able to suggest anyone else who also has a fairly good overview of Hull's Information Strategy who might be available for discussion?

In addition, on the same day, it would be of great assistance if I could also talk to a small number of other people (perhaps from one to five people) who have experience and views of specific parts of either implementing the strategy, or have been involved in, or affected by activities it has covered.

The purpose of these meetings is not to try out my proposed framework in detail, but mainly to gain ideas and to have initial discussions of what might be the best way forward, in terms of people who might be contacted, the time they might be available without imposing too much on anyone's time, and what would be the best way that such contacts might be made (e.g., by visits by me to Hull, or via 'phone or e-mail etc.).

If such meetings are possible, with yourself and possibly with others, may I please ask you to let me know what is convenient, in terms of who it might be possible to see and when they might be available, and their contact details if relevant.

Any assistance you can give me on this matter would be very much appreciated.

Yours sincerely,

Yongmei Nie
Appendix O

The Case Study Questionnaire

1. Control structures
   (Prepare, plan, develop, implement, monitor, review of Information Strategy)

(1) I know that your institution has had an Information Strategy for quite a few years. Have you carried out a Review or Monitoring of the Information Strategy (either formally, or informally)?
   A. If so, how was this done, and with what results?
   B. If not, does it intend to do so? What method(s) will it use?

(2) In developing and implementation of the information strategy, have you used top-down prescriptive approaches, ‘soft’ or emergent-system methods?

(3) What theoretical implications (if any) were formally used to decide the approaches to the development and implementation of the strategy, and what theory is perceived to have been informally used (i.e., been ‘at the back of people’s minds’)?

(4) Which of the control structures phases have been perceived to have ‘worked well’, and which are perceived to have been more problematic?
   A. Is it possible to speculate on reasons for these?
   B. To what extent have broader human-centred issues (motivation, involvement, hierarchy, empowerment, emancipation, etc.) been seen to be factors in the success or otherwise of the various control structures decided upon?

2. External Analysis

(1) Did the planning or implementation of the information strategy take any formal note of the external environment?

(2) Is the information strategy developed to counter ‘threats’ (loss of students, loss of research money, etc.) from other HEIs in the UK or overseas?

(3) Has your institution monitored the competitors’ (strategies, activities and performance?

(4) Have aspects of competitive advantage being considered when developing the institutional information strategy? If so, what methods were used? If not, why not?

3. Internal Analysis

Did the information strategy take any attention to the general university ‘internal environment’? If so, what methods were used; what factors of the internal environment were given focus?
4. Organisational structure

(1) Have you examined the university’s character of its organisational structure in developing or implementing the information strategy?

(2) Do people involved in the strategy think that looking at the university’s organisational structure would have helped to improve the information strategy in some way? If so, in what way?

5. Organisational culture

(1) Was there any attempt to examine the character of the university’s organisational culture in developing or implementing its information strategy? If so, how was this done? What approach was used?

(2) If the university’s organisational culture was not considered explicitly, was there some concept of the university’s culture that implicitly informed the development of the information strategy (e.g. a belief that ‘everyone works to the best of their ability’; or ‘everyone knows information is precious, and that it should be generated and used with integrity’)?

(3) Is it considered worthwhile to take organisational culture into account when developing an institutional information strategy?

6. Information needs analysis

(1) How were the information needs analysis carried out in your university?

(2) What resources were used in the analysis, and what was the time-scale?

(3) What techniques for analysis were used?

(4) What theoretical background supported the methods selected?

(5) Were adequate information items included, and in sufficient detail?

(6) Were the mechanisms used to make the decisions of needs analysis reasonable? Would more attention to human factors have helped? How, and in what way?

7. Resources analysis

(1) Were any models/approaches used to decide the levels of resources needed to carry out each phase of the development and implementation of the strategy?

(2) Were adequate resources applied?

(3) How were conflicts between the need for resources for a given task and the actual availability of people and equipment resolved?

(4) What approaches were adopted for such resolution? Could better approaches have been used?
8. Strategic alignment

(1) In terms of strategies, how do you define the relationship of IT strategy, IS strategy and Information Strategy?

(2) Was any approach made to align the proposed information strategy with the university's existing 'Mission Statement' or 'Strategic Plan'?

(3) If so, how was this done? If not, was this an oversight, or considered not necessary?

9. Managing strategic change

(1) Was any specific over-arching vision used to help manage the strategic change involved in introducing an information strategy to the university?

(2) How were people convinced of the need for the information strategy and of the importance of their role in it?

(3) Were all the people affected by the strategy listened to? Were they called on to help in the decision-making?

10. Evaluative structures

(1) Were any evaluative structures (i.e. for monitoring, reviewing) built into the original development of the information strategy, or put in place since?

(2) If they exist, are such structures intended to gather management opinions, or do they involve the people involved at all levels, in order to allow a better system to emerge?

(3) Are 'emergent' evaluative structures seen as essential, too demanding in manpower or resources, or not useful?

12. Strategic choice

(1) How were the overall strategic choices made? For example
   A. whether to implement the strategy across the whole university in one go, or piecemeal;
   B. whether to build on existing IT, and/or IS (e.g., SRS) or to develop new;
   C. whether to follow JISC guidelines to the letter; or to modify

(2) Does the implemented strategy follow the documented strategy?
   A. If yes, has it produced the desired results?
   B. If no, are there any major problems? What problems?
   C. What are the main causes of the problems? (i.e. problem with the implementation of the information strategy, or with the information strategy itself?)
   D. What should have been done to avoid these problems?
   E. Can you suggest some possible solutions for improvement?

(3) What comments can you make about your institutional information strategy?
**Appendix P**

**Case Study: Name List of Interviews**

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Appendix Q

Summary of the University of Hull’s Information Management Principles

1. It is the aim of the University of Hull to become a knowledge-based institution whose core activities of learning, teaching and research, along with the management and development of those activities, are founded on excellence in the management and exploitation of information resources.

2. The University will promote an institutional culture in which the value of information is well understood, and in which individuals take a responsible attitude towards the creation, use and maintenance of information resources. It will be the responsibility of the senior officers of the University to take the lead in making a reality of this commitment.

3. The University will encourage the sharing of information, discourage the duplication of information, and maintain where appropriate the security of information. It will be open in its attitude to the dissemination of information.

4. Responsibility for the production and maintenance of internal University information resources will be undertaken within an agreed policy framework, to the most appropriate level, ensuring that information is handled by the right person at the right time.

5. The University will establish an agreed ethical and regulatory framework governing the creation and use of information.

6. The University will base the development of its information services and its investment in IT infrastructure on a prior analysis of the business processes that the institution undertakes, re-engineering those processes where necessary, and deriving from the outcomes a clear understanding of the information needs, roles and responsibilities associated with each process.

7. The University will ensure that the information needs of all are met by developing appropriate information services and by exploiting Information and Communication Technologies as effectively as possible.

8. The University will maintain an Information Strategy Review Group as a senior committee of the institution with responsibility for implementing and monitoring the Information Strategy.
REFERENCES
REFERENCES

(References used in the Appendices are also included here.)


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