An Investigation into the use of an Enterprise Resource Planning Framework by British Tennis.

By Christopher Anthony Barr

A thesis submitted for the degree of Doctor of Business Administration at the University of Bedfordshire

Date: August 2010
Abstract

The overall objective of this study is to establish the extent to which an ERP system could be used within the management of British Tennis. Whilst ERP systems are used extensively in commercial organisations, there is little research into the use of these systems in the management of sport by the National Governing Bodies and by the operational providers of sport facilities. This supports the specific finding in the Game Plan (National Strategy Unit, 2002), which identified that the management systems within sports administration need to be improved and that there is a general lack of research within this specific area. The research proposes an ERP framework which can be implemented to achieve a number of improvements in operations and to enable other opportunities such as targeted marketing.

Porter’s Value Chain is used as a model to investigate the organisations involved in the provision of tennis, and this model brings together the two concepts of multi-organisational structures and ERP systems. This enables the selected modules of the ERP system to be mapped on the value chain, and a new value network to be created.

This research uses a predominantly qualitative method which incorporates an iterative approach to the investigation, based on the model by Bryman. Iteration One uses a mixture of in-depth and semi-structured interviews to establish and corroborate the themes identified as part of the literature review. Also there are additional areas of theory identified as part of the data collection process which are explored in more depth. The second iteration is then used to gather further information and information confirmatory to the first iteration.

Findings demonstrate a mixture of governmental, commercial, profit-making and not-for-profit organisations that have no central system in use. The research proposes that a central ERP system, including a number of functional modules, could be implemented into this environment and that it would deliver benefits to all organisations, including cost reduction, managerial benefits, strategic benefits, improved IT infrastructure and organisational benefits.
Acknowledgements

Many thanks to Professor Brian Mathews and Dr John Beaumont-Kerridge for their time, effort and expertise in producing this thesis. Additionally, I would like to thank my wife and family for their support and understanding during this significant endeavour.
Author’s Declaration

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

Christopher Anthony Barr
August 2010
## Contents

**ABSTRACT**  
1

**ACKNOWLEDGEMENTS**  
II

**AUTHOR’S DECLARATION**  
III

**CHAPTER ONE: INTRODUCTION**  
1

1.1. Research Focus and Justification  
2

1.2. Aim of the Research and Research Questions  
4

1.3. Outline of Thesis  
6

1.4. Summary  
8

**CHAPTER TWO: RESEARCH QUESTIONS**  
10

2.1. Tennis National Objectives  
10

2.2. Organisations in British Tennis  
12

2.2.1 Research Question One  
15

2.3. Existing Software and ERP Systems  
15

2.3.1 Research Question Two  
17

2.4. The Value Chain and ERP Connection  
18

2.4.1 Research Question Three  
20

2.5. Summary  
21

**CHAPTER THREE: ERP SYSTEMS – THEORY AND PRACTICE**  
22

3.1 Introduction  
22

3.1.1 ERP Rationale and Alternatives  
22

3.1.2 ERP History and Current Invocations  
25

3.1.3 ERP Concepts  
29

3.1.4 ERP Modules  
32

3.1.5 The Extended and Virtual Enterprise  
35

3.2.6 ERP System Benefits and Risks  
36
3.2.7. ERP Case Studies

3.2. Critical Success Factors

3.2.1. Critical Success Factors in ERP and Innovation

3.2.2. ERP Summary

CHAPTER FOUR: USING THE VALUE CHAIN TO MODEL ERP SYSTEMS IN A MULTIOrganisational Context

4.1. Rationale for the selection of Porter’s Value Chain (1985)

4.2. Value Chain Model

4.2.1. Value Ecology

4.2.2. Scale-Free Networks

4.2.3. Value Chains in a Service Environment

4.2.4. Value Chain and Network Summary

4.3. Value Chain and ERP Integration

4.4. Summary

CHAPTER FIVE: RESEARCH METHODOLOGY

5.1. Introduction

5.2. Research Questions

5.3. Research Method

5.3.1. The Case Study Approach

5.3.2. Advantages of the Case Study Approach

5.4. Replication and Purposive Sampling

5.5. The Selection of Data Collection Organisations

5.6. Research Techniques

5.6.1. Documentation

5.6.2. Interviews

5.7. Validity and Reliability

5.8. Analysis of Data – Content Analysis

5.9. Open Coding External Review
<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.3.</td>
<td>ERP Data Framework</td>
<td>184</td>
</tr>
<tr>
<td>7.3.1.</td>
<td>Issues addressed</td>
<td>186</td>
</tr>
<tr>
<td>7.4.</td>
<td>ERP Network Framework</td>
<td>187</td>
</tr>
<tr>
<td>7.4.1.</td>
<td>Issues addressed</td>
<td>189</td>
</tr>
<tr>
<td>7.5.</td>
<td>Issues Summary</td>
<td>190</td>
</tr>
<tr>
<td>7.6.</td>
<td>ERP System Benefits</td>
<td>194</td>
</tr>
<tr>
<td>7.7.</td>
<td>Value Creation and Ecology</td>
<td>196</td>
</tr>
<tr>
<td>7.8.</td>
<td>Implementation Concerns</td>
<td>197</td>
</tr>
<tr>
<td>7.9.</td>
<td>Implementation Scope</td>
<td>205</td>
</tr>
<tr>
<td>7.9.1.</td>
<td>Summary</td>
<td>206</td>
</tr>
<tr>
<td></td>
<td><strong>Chapter Eight: Conclusions</strong></td>
<td>207</td>
</tr>
<tr>
<td>8.1.</td>
<td>Introduction</td>
<td>207</td>
</tr>
<tr>
<td>8.2.</td>
<td>Research Questions Conclusions</td>
<td>207</td>
</tr>
<tr>
<td>8.2.1.</td>
<td>Conclusions for Research Question One</td>
<td>207</td>
</tr>
<tr>
<td>8.2.2.</td>
<td>Conclusions for Research Question Two</td>
<td>208</td>
</tr>
<tr>
<td>8.2.3.</td>
<td>Conclusions for Research Question Three</td>
<td>209</td>
</tr>
<tr>
<td>8.2.4.</td>
<td>Implications</td>
<td>211</td>
</tr>
<tr>
<td>8.3.</td>
<td>Testing the Framework</td>
<td>212</td>
</tr>
<tr>
<td>8.4.</td>
<td>Limitations of the Study</td>
<td>215</td>
</tr>
<tr>
<td>8.5.</td>
<td>Summary of Contributions to Knowledge</td>
<td>216</td>
</tr>
<tr>
<td>8.5.1.</td>
<td>Extended Value Chain</td>
<td>217</td>
</tr>
<tr>
<td>8.5.2.</td>
<td>Extending the Software as a Service to an Extended Network of Organisations.</td>
<td>217</td>
</tr>
<tr>
<td>8.5.3.</td>
<td>Power and Politics in Sport and Systems Implementation issues.</td>
<td>218</td>
</tr>
<tr>
<td>8.6.</td>
<td>Directions of Future Research</td>
<td>218</td>
</tr>
<tr>
<td>8.7.</td>
<td>Summary</td>
<td>220</td>
</tr>
</tbody>
</table>
APPENDIX A: INTERVIEW RESPONDENTS 221

APPENDIX B: ENTERPRISE SYSTEM BENEFIT FRAMEWORK (SHANG AND SEDDON, 2002c) 225

APPENDIX C: SAMPLE INTERVIEWS 231

APPENDIX D: CODING EXTRACT 248

BIBLIOGRAPHY ERROR! BOOKMARK NOT DEFINED.
List of Figures

Figure 1: Porter’s Value Chain Model (Porter, 1985) 19
Figure 2: Porter’s Value System (Porter, 1985) 20
Figure 3: Three-Tier Systems Architecture 30
Figure 4: Updated DeLone and McLean Information Systems (IS)Success Model (DeLone and McLean, 2003) 42
Figure 5: Porter’s Value Chain Model (Porter, 1985) 56
Figure 6: Porter’s Value System (Porter, 1990) 57
Figure 7: Health Care Value Chain (Pitta and Laric, 2004) 58
Figure 8: Interrelated Value Chains 60
Figure 9: Stages of E-Business Transformation (Burn and Ash, 2005) 64
Figure 10: Amended Value Chain module. 71
Figure 11: Mixed Methods Research Paradigms (Johnson et al., 2007) 77
Figure 12: Bryman’s Research Process (Bryman, 2001) 78
Figure 13: Health Care Value Chain (Pitta and Laric, 2004) 138
Figure 14: Value Network for British Tennis based on the Pitta and Laric (2004) Model 139
Figure 15: Tournament Value Chain 143
Figure 16: Updated DeLone and McLean IT Success Model (2003) 154
Figure 17: Stages of E-Business Transformation (Burn and Ash, 2005) 173
Figure 18: Value Chain Model updated for the LTA Framework 174
Figure 19: Scope of Implementation 175
Figure 20: ERP Data Framework 184
Figure 21: Membership Data Flow Diagram 185
Figure 22: ERP Network Framework 187
Figure 23: POT Diagram (Laudon and Laudon, 1995) 198
Figure 24: Updated DeLone and McLean IS Success Model (DeLone and McLean, 2003) 202

Figure 25: Sportcom Scope 214
List of Tables

Table 1: Game Plan UK Sports Structures (National Strategy Unit, 2002) 13
Table 3: Comparison of CSF for Innovation and ERP systems. 49
Table 4: Knowledge Value Chain (Eustace, 2003) 66
Table 5: Organisations involved in Tennis using the Game Plan Framework 84
Table 6: Advantages and Disadvantages of the use of Documentation (Yin, 2003) 85
Table 7: Organisational responses 94
Table 8: Respondent Theme Frequency 99
Table 9: Value Chain Linkages 113
Table 10: LTAD Development Stages (Balyi, 2001) 163
Table 11: Requirement Matrix 194
Table 12: ERP Implementation Stages 200
Table A-1: Anonymous List of Respondents’ Credentials 224
Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCP</td>
<td>Central Council of Physical Recreation</td>
</tr>
<tr>
<td>CDO</td>
<td>County Development Officer</td>
</tr>
<tr>
<td>CSF</td>
<td>Critical Success Factors</td>
</tr>
<tr>
<td>CRM</td>
<td>Customer Relationship Management</td>
</tr>
<tr>
<td>DCMS</td>
<td>Department for Culture, Media and Sport</td>
</tr>
<tr>
<td>DfeS</td>
<td>Department for Education and Skills</td>
</tr>
<tr>
<td>ERP</td>
<td>Enterprise Resource Planning</td>
</tr>
<tr>
<td>GCC</td>
<td>Global Commodity Chain</td>
</tr>
<tr>
<td>GVC</td>
<td>Global Value Chain</td>
</tr>
<tr>
<td>HPC</td>
<td>High Performance Centres</td>
</tr>
<tr>
<td>ISRM</td>
<td>Institute of Sport and Recreation Management</td>
</tr>
<tr>
<td>IT</td>
<td>Information Technology</td>
</tr>
<tr>
<td>LTA</td>
<td>Lawn Tennis Association</td>
</tr>
<tr>
<td>LTAD</td>
<td>Long Term Athlete Development</td>
</tr>
<tr>
<td>NGB</td>
<td>National Governing Body</td>
</tr>
<tr>
<td>PESSCL</td>
<td>PE, School Sport and Club Links</td>
</tr>
<tr>
<td>SaaS</td>
<td>Software as a Service</td>
</tr>
<tr>
<td>SME</td>
<td>Small and Medium Enterprises</td>
</tr>
<tr>
<td>SOA</td>
<td>Service-Oriented Architecture</td>
</tr>
</tbody>
</table>
Chapter One: Introduction

Tennis is one of the top ten sports played in Great Britain (National Strategy Unit, 2002) and is enjoyed by between three and four million players a year (The Times, 2006, LTA, 2007a). The tennis-playing public have a variety of options of where to play, from privately owned clubs and facilities to courts, schools and colleges provided by the council. These facilities are all independently operated and there is no single ownership of resources and, commensurately, there is no single software system that allows the Lawn Tennis Association (LTA), as the sport’s National Governing Body, to offer centralised support for the players, coaches and clubs. The strategy document produced by the Cabinet Office, commonly referred to as the Game Plan (National Strategy Unit, 2002), specifically states that “many management systems could be improved”.

This thesis examines to what extent a modern Enterprise Resource Planning (ERP) system can be implemented in a public and private multi-organisational environment to improve the management systems currently in use. Davenport (2000, p3) said that “The combination of Enterprise Systems as the primary platform for organizational information and of Internet technology for providing access to it will be the hallmark of leading organisations in the new century”. The investigation highlights benefits of an ERP system implementation, including productivity improvement, E-business benefits and additional marketing opportunities. As part of the investigation the research investigates the objectives and IT systems currently in use by the existing organisations and identifies a number of issues which are then addressed as part of the ERP framework proposal.

The area of research of using ERP systems in sports and, specifically, the use of ERP systems by the organisations involved in British Tennis, is an area which has not obviously been researched before, and there are no references to research of this nature found as part of the search of the literature available. This is a specialised area of investigation and, although this is a niche area, the results could be applied to other organisations that operate in a similar public and private multi-organisational environment. The thesis uses an existing framework from Shang and Seddon (2002c) which details an extensive list of benefits researched and created from existing ERP organisations in order to identify potential benefits of the proposed solution and how they might be applied in this environment.
1.1. Research Focus and Justification

The focus and justification of the research is to investigate and assess to what extent an ERP model can be implemented into the chosen organisations and what benefits could be expected and accrued. The focus and justification for the thesis has four different aspects which are relevant. These are:

i) the lack of research into ERP systems usage by sports National Governing Bodies (NGB) and into sport in general.

ii) the applied nature of the research. ERP systems have been in use by multinational organisations for many years and this research discusses how they could be applied to a new sector of commercial and not-for-profit usage.

iii) that there are significant benefits to be accrued for the LTA and to other NGBs. A number of these benefits are identified as part of the thesis using work done by Shang and Seddon (2002c).

iv) the contribution to knowledge. There are three areas discussed where this work brings additional contribution to knowledge concerning the use of ERP systems where it has not been researched before.

These four items are discussed in more detail below.

Firstly, there is a paucity of previous research and documentation concerning the use of technology in sport whether this is at the organisation, work-group or individual level (Slack, 1997, p164). Slack goes on to say that ‘technology can influence the structuring of an organisation, particularly at the work-group or departmental level. Consequently, it becomes important for managers in sport organisations to understand the impact of technology, in particularly changing technology, on their organisations”. Interestingly, Slack does say that it is also important to take account of the differences between manufacturing and service organisations and to employ a framework that takes account of the differences. This is discussed further in the Value Chain discussion in Chapter Four.

Also the Game Plan document (National Strategy Unit, 2002) references the need for the development of systems and specifically asks “Does it have the necessary performance, governance and management systems in place?” Whilst not specifically referencing large scale IT systems, it is hard to conceive how modern large organisations with complex networks (both technological and organisational) could operate with out a presence on the internet or with the systems behind to support it.
Secondly, from an applied perspective there is a distinction between a Doctor of Philosophy and a Doctor of Business Administration. The Association of Business Schools criteria, as quoted in Jankowicz (2002, p.2), require that a DBA thesis provides “a significant contribution to the enhancement of professional practice in the business area through the application of and development of theoretical frameworks.” The applied nature of the thesis is with the application of the framework to a real life environment using the theoretical framework backed by the knowledge of the benefits accrued by large organisations such as Bay Networks, Elf Autochem, Dow Chemical cited by Davenport (2000, p30), the academic research of people such as Hitt et al. (2002) who demonstrated a positive link with company profitability and ERP systems and the benefits accrued by companies summarised in the work by Shang and Seddon (2002c).

Thirdly, Chapter Three discusses the framework and history of ERP systems and importantly includes a discussion concerning the benefits of ERP systems to large organisations with large numbers of both internal and external users. The Shang and Seddon (2002c) framework identifies five major areas an approximately 90 sub-headings of benefits. These include:

- Enabling e-commerce to attract new customers and to expand into new markets or reach new groups of consumers.
- Reducing the cycle time of the publication of LTA and affiliated tournaments results and publication of the LTA player ratings and rankings information.
- Building a strategic vision using a common platform. Shang and Seddon (2002c) identified several strategic benefits of a single unified ERP system, including supporting business growth, building consistent IT architecture in different business units, and building process innovation in areas such as new market strategy, new process chains and supporting new products and services.

From a business perspective, identifying benefits to the British tennis-playing public and the LTA is a significant justification, but the research also has important academic implications. From an academic perspective the research includes a contribution to knowledge in three specific areas. These are:

1) **The extended value chain.** This research investigates the use of a services value chain in the form of the provision of tennis from government
departments through to the delivery of tennis via clubs, councils and commercial ventures. This crosses both public and private and commercial and not-for-profit boundaries.

2) **Extending the use of Software as a Service (SaaS) infrastructure to an extended network of organisations.** The SaaS framework is proposed and extended to enable data separation and security to the clubs and affiliates and also provide a central repository of data which can be used by the LTA for marketing and analysis.

3) **Power and Politics in sport and Systems implementation issues.** Slack (1997, p184) identified a number of issues about the structure and organisation of sports clubs and there has been a significant amount of research in ERP implementation issues but there has not been any investigation in how power and politics issues can affect an ERP installation. The areas where the two research areas overlap highlight the areas where ERP implementation issues would most be at risk in this framework. This analysis has not been done before and gives a new perspective on issues surrounding ERP systems implementation into sports environments.

Lastly, the benefits realised by the proposal are applicable to other business organisations that have similar value chain and network models. This would obviously include other sporting organisations which have a National Governing Body structure similar to the LTA, but it could also apply to charities which have significant value networks which include public and private organisations, including commercial and not-for-profit concerns.

1.2. **Aim of the Research and Research Questions**

The research is formed around the use of research questions as put forward by the Bryman (2001) framework discussed further in Chapter Five. This framework is an iterative approach which incorporates the opportunity for further additional theory. The three research questions are:

1) *What are the objectives of the organisations identified in the provision of British Tennis and what are the linkages between them?*

2) *What are the principal software systems currently in use by the organisations and how effectively are they used in terms of system and information quality?*
3) To what extent can an ERP system be implemented in a public and private multi-organisational model?

The research questions have been devised to create a flow of information and data which then supports the overall objective of the research which is to establish to what extent can an ERP system can be implemented in a public and private multi-organisational model i.e. Research Question Three. Research Questions One and Two have been formulated primarily based on the available research albeit there is a paucity of research in this area as already referenced by Slack (1997, p164) and the Game Plan (National Strategy Unit, 2002). It is also the Game Plan that gives the start point for identifying the organisations involved in the sport. Table 1 in Chapter Two shows the number and variety of organisations involved spread across government, commercial and not-for-profit sectors. In order to make sense of these organisations Question One was formulated and this tries to establish the varying objectives of the organisations involved. Having established what the organisations are then the other key aspect of Research Question One that is critical in the research is the data communications between the various organisations i.e. what information do they share with each other if at all? Research Question One uses Porters Value Chain (Porter, 1985) as a model on which to investigate and organise the entities concerned.

Having identified the organisations involved, it is necessary to then investigate further what level of Information Technology is currently in use by the various organisations. This forms the basis of Research Question Two. Although there is a general lack of research in this area as mentioned previously it was clear from the Game Plan (National Strategy Unit, 2002) that there is a general lack of systems involved in the provision and management of sport within the sector and that it therefore important to establish what this level of IT usage is. It is also important to establish how effective the systems are that are currently in use and the Delone and Mclean (1992) is used to discuss this aspect further as it is a highly subjective aspect of system usage.

The results of Research Questions One and Two are then used to discuss Research Question Three. Research Question Three seeks to unify the collective strands of the research in order to answer the question as to the extent an ERP system can be implemented into this environment. This is done via the development of a theoretical framework which is based on evidence from the research and also date from the various respondents.
This framework is part of the development of the sport and ERP systems implementations. The research seeks to construct a strategic framework that will deliver benefits to the LTA and the tennis-playing public, such as improved communications, new functionality to clubs, and increased and more targeted marketing potential to members and non-members.

As an professional IT consultant with over thirty years experience within the IT industry, the author has worked on a number of large scale ERP implementations with multi-national organisations as well as being a keen tennis player and involved in the management of medium and large clubs. With the author’s engagement with the DBA programme the possibility arose for investigating how a value chain relationship exterior to the central organisation (as opposed to purely internal implementations) and cross boundaries could be utilised and also the experience seeing the benefits to an organisation and how this might be applied to a field where ERP systems have not been implemented and to add to the applied contribution to knowledge in an area where the existing research is poor.

1.3. Outline of Thesis

This chapter has outlined the environment in which tennis is played in the UK and the opportunities that an integrated ERP might provide from both a technological perspective and a functional perspective.

The thesis will examine the technological opportunities that a large-scale ERP would offer the LTA and the wider population of clubs, councils and the tennis-playing public in general. This will enable the development of a framework which could be deployed for success in improving the numbers and standard of tennis players within Great Britain.

**Chapter One** is the introduction to the thesis and gives an overview of the document and highlights key points. It outlines the aims of the thesis and introduces the three research questions.

**Chapter Two** details the research questions that form the basis of the thesis. It includes a review of the national objectives and introduces the Game Plan produced by the National Strategy Unit (2002), which gives the landscape of organisations involved in the research. This document gives the background to Research Question One, which concerns the
various objectives, linkages and interactions of the organisations concerned. These organisations also have established systems and the section goes on to discuss Research Question Two, which analyses the existing software, its issues and its effectiveness. At this point the value chain and network concepts are introduced, which links the organisations and the ERP systems for Research Question Three. The chapter concludes with the review of how Research Question Three brings together the themes and issues indentified and to what extent an ERP system can be used in this environment.

Chapter Three reviews ERP systems and looks at the history and concepts as well as discussing the extended ERP approach, plus benefits, costs and case studies. A short history of ERP systems gives the background to how they were developed and are still developing and also introduces the concepts of Application Service Provider and Software as a Service models. The basic concepts of the systems are discussed to elucidate the concepts of client server architecture, modular designs, extended network and remote access, and the common database. As there are no formal definitions of what is included in an ERP system there is a discussion of what is relevant to the research and how it was derived. The chapter also includes a discussion of the benefits and costs of an ERP system, and two case studies which identify benefits to the organisations involved in the case study research. There is also a discussion concerning ERP critical success factors (CSFs) which highlights the key items that are required for successful ERP implementation.

Chapter Four reviews Porter’s Value Chain (1985) as the model to bring together the two concepts of multi-company organisational structures and ERP systems. The chapter maps the modules of the value chain onto the functional modules of the value chain and also maps interrelated components between organisations. This premise is then extended to the value ecology of the premise of adding value not just within a firm but for the ecology as a whole, utilising networking concepts such as the Extranet and collaborative networking. The concept of scale-free networks is then discussed to understand its importance to the extended value chain. The final section in this chapter creates a new value chain with the ERP modules overlaid.

Chapter Five reviews the research methodology, including the data selection and research techniques of open and axial coding. The research uses Bryman’s research process (2001) as the framework, which incorporates setting out the research questions and then using an iterative approach to the data collection and additional theory. This chapter then reviews the
data collection method of interviews and documentation and the resulting content analysis via open coding and axial coding methods. The associated issues of reliability, validity and ethical considerations are also reviewed.

Chapter Six is the analysis and discussion section of the thesis. It is broken down into analysing the information pertaining to the first two research questions, and this is further broken down into the two iterations and additional theory identified during the iterative process. For Research Question One, Iteration One covers the organisational goals and objectives of the organisations under review, an analysis of their linkages and the open coding analysis required to identify issues. As a result of this there follows a discussion concerning further areas for research. Iteration Two for Research Question One then identifies additional findings as part of the further interviews. The discussion of the results of the analysis is then included in this section, which includes the updated value chain. This model is repeated for the second research question.

Chapter Seven reviews Research Question Three in detail, i.e. the extent to which an ERP system can be applied to the British tennis environment. The model proposes a centrally hosted system that includes the Software as a Service features discussed in Chapter Three. This is then extended to describe the module structure and the issues that are addressed as part of the architecture. A sample data framework is described to demonstrate the type of data structure that could be used, together with the network framework, in order to deliver the solution. This then concludes with a discussion on the system benefits.

Chapter Eight concludes the thesis, with conclusions and recommendations for the three research questions. This section also includes a method of testing the framework in order to prove that the solution is viable in a business environment, it discusses the limitations of the study and lists the contribution to knowledge and, finally, gives suggestions for directions for future research.

1.4. Summary

Modern ERP systems offer a number of benefits to modern organisations which will enable them to be more productive, deliver their objectives and expand as organisations. Additionally, the Game Plan (National Strategy Unit, 2002) highlights the need for an improvement in management systems. This thesis investigates the extent to which an ERP system can be used in the environment of British Tennis in order to deliver benefit to the
principal organisations involved. The environment of these organisations, however, is not a simple structure and there is a mixture of public and private organisations, not-for-profit and commercial organisations, and small firms and large companies.

The intention of the thesis, therefore, is to identify the organisations involved, their objectives and current IT systems, and to identify the extent to which an ERP system can be mapped onto the environment, and the benefits that are likely to be delivered as a result.
Chapter Two: Research Questions

Chapter Two lists the research questions that the thesis will address. The first part of the chapter reviews the tennis national objectives and introduces the Game Plan (National Strategy Unit, 2002) which gives the organisational landscape that is discussed during the thesis. This review of the organisations involved leads into Research Question One, which concerns the objectives of these organisations and the linkages between them. In order to develop the investigation into the extent to which an ERP system can be utilised it is important to understand the existing landscape of ERP system technology and the use of existing software within the organisations identified, which is the premise of Research Question Two. The organisations and the software need a glue to bind them together into a single entity that can be used to evaluate the data and understand the various interactions and linkages. The model used to develop this investigation into the benefits [or success] of an ERP system is Porter’s Value Chain model (Porter, 1985).

Using the information gathered by the previous two research questions, Research Question Three assesses the extent to which an ERP system can be implemented in a public and private multi- organisational model.

The beginning part of this section reviews the national objectives as identified by the government, and positions these against the participation by elite sports people and also the grassroots players sports involvement. Using the information from the government paper, the next section reviews the main organisations identified at a high level which positions them as part of Research Question One.

2.1. Tennis National Objectives

The government’s National Strategy Unit published a paper in 2002 called the “Game Plan” (National Strategy Unit, 2002). This discusses the structure of sport in the UK and details the government’s vision and strategy for sport, from both mass participation and performance perspectives, up until 2020. The document identified the organisations involved in the provision of sport in the UK and also sought to provide a rationale and an action plan for the development of sport itself. Accordingly, it identified the national objectives and key stakeholders for sport. The stakeholders identified are used to build the value chain and network discussed further in Chapter Four.
Both the government (via the DCMS strategy unit) and the LTA have the stated objective of improving the standard of play at both international and grassroots levels. The Game Plan (National Strategy Unit, 2002) has a specific objective: “a sustainable improvement in success in international competition, particularly in the sports which matter most to the public, primarily because of the “feel good factor” associated with winning”. Most important, for this research, is that they specifically state that the management systems in use need improving. This statement can be interpreted to include the IT systems which are either management systems in their own right or act as support systems for other management initiatives. As also stated in the report, the United Kingdom has not had a winner in the Football World Cup, the European Championships, the Rugby Union World Cup or the Ashes, or had a Wimbledon or Grand Slam tennis tournament winner, in the last 15 years. Actually, it is 30 years since Virginia Wade won the ladies’ singles in 1977 and Ann Jones in 1969 (www.wimbledonwinners.com, 2009). Since the report was written in December 2002 England has won the Rugby World Cup in 2003 and the Ashes in Cricket in 2005.

The Game Plan (2002) placed a more explicit emphasis on the relationship between sport, education and health policy. What has appeared to happen in practice is that regional bodies are being encouraged to focus on how sport might contribute to concerns about health, crime reduction, community and regeneration. At the same time, community sport should act as a “pipeline” for regional talent in order to achieve its potential.

There is an argument that there has been a “qualitative shift in the sports-participation culture away from the egalitarian and empowering aspirations of community-based sporting activity to a hierarchical and alienating culture of high-performance sport” (Green, 2004). Green also cited a former high-ranking official at the British Athletic Federation who suggested that “what athletics, and sport generally, is trying to do is find talent and hothouse it to the top…We don’t believe that any experience is, in a sense, intrinsically worthwhile anymore”. The implication is that the activities are now only worthwhile if they result in Olympic medals. In interviews as part of Green’s research, there was an assertion that certain sports are judged by the eight days competing in the Olympic Games, regardless of how well the national teams have performed at any other international events.

Green (2004) summarises by saying that winning medals is just as important as taking part in sport. However, empirical evidence has revealed that elite sport objectives have assumed increasing priority over other conceptions of sport participation. As Green (2004)
points out above, there has been a shift away from community-based sporting activity and into winning competitions and medals but this shift is only part of the Game Plan (2002) objectives which also includes grassroots participation, as referenced earlier. Large-scale access of online systems by the general public, used in conjunction with a comprehensive marketing campaign and online facilities of an ERP system, could be used to address the grassroots access and develop community and local sports (tennis) opportunities and participation.

One of the other government departments specifically named in the report is the Department for Education and Skills (DfES). In 2003 they published their own strategy paper which they called Learning through PE and Sport. Although it does seem to be more commonly referred to as the launch of PE, School Sport and Club Links (PESSCL). This initiative is an attempt to bridge the gap between schools and clubs, but Green (2004) is not convinced that the creation of ‘school sport coordinators’ and the ‘School Sport Alliance’ to join up the work of central government as one part of the strategy brings about positive outcomes. This linkage will be explored further in the thesis but it highlights the importance of cooperation between the different organisations that the DfES identified and it is for this cooperation and linkage that an ERP system could be used as a large-scale online system which promotes joint initiatives, a consistent view of tournament ratings and rankings, and a comprehensive database of players.

In summary this gives a picture of the overarching objectives and background of how sport has been run in the UK. It is a picture of change with no single body in overall control, and no single strategy until the Game Plan (2002) sought to unify objectives from disparate organisations. Although the Game Plan does provide a framework at a top level, it does not define tactical or operational methods to achieve the objectives and, consequently, there is no top-level strategy for systems and technology.

2.2. Organisations in British Tennis

The principal bodies involved are identified from the government Game Plan strategy paper (National Strategy Unit, 2002) . This has not formally been superseded and still remains the principal strategy document for sport in the UK as well as a vision for the future. The Game Plan does identify the principal organisations involved in the provision of British sport, as outlined in Table 1. This table will be analysed in more detail further on in the thesis, but it is important to introduce it at this stage as it identifies the key organisations involved in the provision of the sport.
### National (Government) vs. Nationals (Non-Government)

<table>
<thead>
<tr>
<th>National (Government)</th>
<th>Nationals (Non-Government)</th>
</tr>
</thead>
<tbody>
<tr>
<td>- DCMS</td>
<td>- UK Sport</td>
</tr>
<tr>
<td>- Other government departments</td>
<td>- UK Sports Institute</td>
</tr>
<tr>
<td></td>
<td>- Sport England</td>
</tr>
<tr>
<td></td>
<td>- English Institute of Sport</td>
</tr>
<tr>
<td></td>
<td>- National Governing Bodies</td>
</tr>
<tr>
<td></td>
<td>- National sports organisations incl.</td>
</tr>
<tr>
<td></td>
<td>Youth Sport Trust, CCPR and Sportscoach UK</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Regional</strong></td>
<td><strong>Local</strong></td>
</tr>
<tr>
<td>- SE regional offices</td>
<td>- Local authorities</td>
</tr>
<tr>
<td>- Regional cultural consortia</td>
<td>- NGB local levels</td>
</tr>
<tr>
<td>- Regional sports boards</td>
<td>- Local sports councils</td>
</tr>
<tr>
<td>- Government offices</td>
<td>- Local sports clubs and associations</td>
</tr>
<tr>
<td>- Regional federations of sports and recreation</td>
<td>- Private health and fitness clubs</td>
</tr>
<tr>
<td>- NGB regional and county level</td>
<td>- Further and higher education institutions</td>
</tr>
<tr>
<td></td>
<td>- Schools (private and state-run)</td>
</tr>
</tbody>
</table>

**Table 1: Game Plan UK Sports Structures (National Strategy Unit, 2002)**

The Game Plan (National Strategy Unit, 2002) is intended as a framework for all sports and therefore the structure has been modified to make it tennis specific e.g. where it references the National Governing Body (NGB) this is replaced by the Lawn Tennis Association as the NGB for tennis in Britain. The organisations listed vary between government agencies, private clubs, educational organisations and commercial ventures. Each of these has different responsibilities and objectives and they are listed in summary.

The principal organisations or groups are:

1. **Central Government.** The Department of Culture, Media and Sport has two objectives (National Strategy Unit, 2002):
   
   a. A major increase in participation in sport and physical activity, primarily because of the significant health benefits and to reduce the growing costs of inactivity; and
b. A sustainable improvement in success in international competition, particularly in the sports which matter most to the public, primarily because of the "feelgood" factor associated with winning.

2. **LTA.** The Lawn Tennis Association has a stated objective to: “create a tennis environment which will make Great Britain one of the world’s leading tennis nations” (www.lta.org.uk, 2006)

3. **Regional LTA.** These are the county branches of the LTA and are affiliated to the association.

4. **Independent Tennis Clubs.** These are the local tennis clubs which can be found all over the country. They are typically run by volunteers and have a local committee structure to oversee the running of the courts and to arrange social and competitive tennis. There are approximately 2,600 clubs (LTA, 2007a) in the UK which are independent and are a mixture of not-for-profit and commercial organisations.

5. **Schools and Universities.** Sport is provided as part of the curriculum for schools and there are also facilities at most universities.

6. **Commercial organisations.** There are a number of commercial organisations which offer tennis as a fee-paying option. Probably the best known are the David Lloyd centres which are a nationwide chain offering indoor and outdoor tennis.

7. **Local Councils.** Councils provide sports and leisure facilities ranging from free local courts to indoor facilities. These are either directly owned by the council or as outsourced facilities to commercial organisations or trusts.

All these organisations and groups have different levels of professionalism. The local clubs are run by volunteers and amateurs who have a passion for the game and give freely their time to run it. Conversely, the commercial organisations have paid staff and the objective of those organisations is to make profit.

These organisations have internal and external processes to achieve their objectives and they also have linkages to each other in order to pass on information, whether this is personal information or for marketing purposes.

Given the large number of organisations and stakeholders and the large numbers of people involved, the thesis seeks to examine the linkages between the various organisations and establish that ERP systems can deliver benefits by demonstrating that the technology can enable the communication and passing of information between the various organisations. As
Lyle (1997) states: “it is clear that unorganised activity is not sufficient to generate the conditions for sporting excellence. It is equally clear that a system, if one can be said to exist, needs a measure of control and direction”.

2.2.1 Research Question One

The previous sections discussed the high-level strategy as determined by the government white paper, and gave an overview of the organisations and stakeholders involved in the provision of the sport. It is a picture of a large number of independent bodies with no real overall control from any single entity, a wide range in the size of organisations and a variety of expertise of the people involved in those organisations, especially from an IT systems perspective.

The purpose of the first research question is to analyse the objectives and linkages between the organisations, using interviews as the primary research methodology to understand the interactions between the various organisations, and to ascertain whether there are any other groups that are important to include that have not previously been identified. The research question to progress this is as follows: What are the objectives of the organisations identified in the provision of British Tennis and what are the linkages between them?

2.3. Existing Software and ERP Systems

The LTA has 2,600 clubs that are affiliated and there are 388 local authorities (LTA, 2007a) that provide tennis facilities to different levels. They are all independent of each other and clearly have a multiplicity of differing software systems and a wide range of IT skills. A large number of the clubs rely on volunteers, which adds another dimension as to how software is used and managed. As well as the clubs and local authorities referenced the other organisations mentioned (LTA, regional LTAs, DCMS, schools, commercial clubs) can utilise systems in a similar way but rely less on volunteers and subscription income. In summary, all of the organisations are likely to use existing Information Technology at some level and the second research question focuses on this aspect. In order to understand the potential benefits of an ERP system, the existing utilisation must be understood and evaluated to ensure that it is beneficial, can resolve the issues identified, and can be realised.

The idea of integrated systems has been around for a number of years (Tomeski, 1970) although the concept of an Enterprise Resource Planning system did not emerge for another
few years after Tomeski published his initial work. However, modern technology and the
general increase in the use of the internet now mean that systems can and have extended
beyond the boundaries of the organisation which is shown by the use of Extranets
(Anandarajan et al., 1998). The ability for systems to be used by multiple companies on
multiple sites is now commonplace and comes in many forms, from Extranets to fully
publically accessible websites. This level of access and integration has become possible due to
the use of integrated or Enterprise Resource Planning (ERP) systems (Anandarajan et al.,
1998).

Although there is no formal definition of ERP systems, Thomas Davenport (2000)
provides a description of ERP systems as “a set of integrated systems, typically provided by a
single vendor”. Each vendor offers a similar set of application modules which all fit together.
For instance, the Customer Relationship Management (CRM) module from a large ERP
vendor includes marketing, order management and service functionality (Oracle, 2009). The
information produced by these modules will be accessible by an internal network or externally
via secure access or an Extranet (Davenport, 2000).

The vast majority of companies use Information Technology, from simple email
through to complex fully integrated manufacturing systems or scientific analysis super
computers, and the installations by large, medium and even small companies is increasing
(Davenport, 1998). The usage has grown exponentially over the last two decades as microchip
technology has provided smaller, faster and more efficient systems. Accordingly, the software
which is available to run on these systems has grown at the same exponential rate, and has
grown in functionality and complexity.

The application software industry is a multimillion-pound industry and companies
have a number of choices when faced with the requirement to develop or buy software to run
their business. The important aspect of application software is the growth of the integrated
systems that allow a single system to run all of a company’s operations and also extend access
up and down the value chain and network. This means that an order taken on the system by the
sales team should be immediately available for picking and dispatch by the distribution team
and then the invoice can be sent using the same information. The applicability of this to the
research areas is important. For example, tournament results entered online by the player or
tournament organiser could be immediately available to the ratings and rankings systems and
national coaches. Clearly this is a very simplistic view and this area is covered in far greater depth later in the document.

Large organisations which have large IT departments face a number of challenges in the use of IT to support their business, but these challenges are also applicable to government departments, pseudo-public organisations such as the LTA, and the SME (Small and Medium Enterprises) companies; the issues faced are just on a smaller scale. Additionally, there is a paucity of research from an academic perspective on the use of IT systems in general within SMEs (Swartz and Broaden, 1997) and, by inference, the research into the use of systems in the value chain of small and medium sized sports-related agencies.

Having identified the organisations from Research Question One, the next step is to understand the systems that are currently being used by these organisations and understand their function and the mapping of these systems onto an ERP functionality framework. This will identify the functionality of systems in use today in order to map these onto an ERP framework.

2.3.1. Research Question Two

It is important to establish the effectiveness of the existing IT systems in use by the various organisations covered by the research. One of the frameworks most commonly used to establish the effectiveness of IT systems is the DeLone and McLean model (DeLone and McLean, 1992). There has been notable academic critique of this model (Seddon, 1997) and it has been used by commercial organisations (Salehi and Keramati, 2009) and government (Wang and Liao, 2008) to analyse the effectiveness of their implementations. Two of the base components of this model are the information systems quality and overall systems quality which is why these two aspects are referenced in the research question.

This will also identify principal data flows between the organisations. Research question two, therefore, is as follows: What are the principal software systems currently in use by the organisations and how effectively are they used in terms of system and information quality?
2.4. The Value Chain and ERP Connection

The first two research questions look at the national objectives, stakeholders/organisations, and at the Information Technology that is in use today. The focus of the research is to identify how an ERP system might be implemented in a multi-organisation environment and, as such, the linkages between the organisations are a critical component to the overall implementation. The information available via the Game Plan (National Strategy Unit, 2002) demonstrates that there are a number of disparate organisations from different sectors (Government, Non Government Nationals, Regional and Local organisations) and so the requirement is for a model to meet the twofold needs of how to organise and categorise the organisations into a manageable structure and also, and as importantly, how to link these organisations on to the technical and functional requirements of an ERP framework. Clearly, the number of models that meet both of these requirements in a single entity is limited. This is discussed further in Chapter Four.

The model selected therefore, in order to bring the two research questions together and map then onto an ERP framework is Porter’s Value Chain, Value System and Value Network model (1985).

The value chain was first put forward as a model in the seminal work of Porter (1985). He created a model of the various operations of an organisation which all go to create value for an organisation; see Figure 1.
The value chain focuses on the internal functions of an organisation but these functions communicate with other external organisations; this was identified as the value system. This was identified by Porter (1985) and by others (Bhatt and Emdad, 2001, Eustace, 2003, Bititci et al., 2004, Pitta and Laric, 2004, Prahalad and Ramaswarmy, 2004, Hearn and Pace, 2006). Porter himself extended the idea of the value chain to this effect by the use of what he calls the value system; see Figure 2.

Within British Tennis there are a number of stakeholders and interested parties, all with differing tactical objectives but with similar goals; or at least if one group succeeds it will have a positive effect on the rest of the stakeholders. There are now also systems which allow various different organisations to access, interrogate and update a common system that allows data to be passed between them in a fast, timely and secure manner.
Chapter Four discusses the integration of the value chain and the ERP module listing in more detail and develops a model that is used for further analysis. It also develops an extended value chain model used by Pitta and Laric (2004) which is also extended and redeveloped for the organisations involved in the research.

An analysis of the value chain and value network will allow a recommendation to be made as to how British Tennis could use an integrated system that allows the sharing of information across many organisations from marketing activities, financial forecasting and CRM activities. Additionally, there are other components which are specific to the sport where large-scale systems can be beneficial. As an example, the personal information concerning individual results and national rankings plus tournament entry and results solutions that are specific to tennis are highly important to the progression of the sport.

2.4.1. Research Question Three

The previous two research questions identify the organisations involved and the various interactions plus the systems in use, their effectiveness and any issues. This will provide the evidence to propose a framework in order to demonstrate that modern-day, large-scale integrated systems sitting on high speed broadband networks will deliver benefit to the public and to the LTA and associated organisations. This is assessed to understand to what
extent this can be implemented, what the resultant issues might be, and the critical success factors to be considered.

Finally, to complete its significant contribution to the enhancement of British Tennis, this research constructs a strategic framework which would allow all groups to meet and exceed their objectives by improving the functionality of the existing systems, and also the communications between the organisations, consumers and all interested parties.

Research Question Three seeks to unify the literature review with the two previous research questions in order to propose an ERP framework. Question Three, therefore, is: To what extent can an ERP system be implemented in a public and private multi-organisational model?

2.5. Summary

The three research questions have been outlined in this section in order to set the framework for the rest of the thesis. Chapter Three identifies the academic principles behind ERP systems, the issues of power and politics in sport, and the use of Porter’s value chain and value network. The research questions will be raised again in this chapter in order to clarify and amplify the questions as part of the overall thesis.
Chapter Three: ERP Systems – Theory and Practice

3.1 Introduction

This section looks in more detail at how ERP systems have developed; what benefits and costs they bring to an organisation; the concepts and structure of a system; and how that system can fit into an extended or virtual enterprise. ERP systems comprise a number of different modules and the element that distinguishes ERP systems from other software solutions is the design of the software that allows integration amongst different elements of the business (Siriginidi, 2000). Additionally ERP systems have now been developed to improve by enhancing their networking capabilities (Jaiswal and Kaushik, 2005). Systems have evolved that would not have been able to support some of the concepts discussed above just a few years ago, but ERP systems have now developed to a point where they offer a new model of corporate computing (Davenport, 1998).

There is a perception that ERP systems are best suited for large companies, but there is also research suggesting that the ERP movement is ready to move into the SME market and that it can support a wider range of company or organisation size than may have been true a few years ago (Adam and O'Doherty, 2000). Additionally, the functionality has been evolving, such as Software as a Service (SaaS) discussed later on in the chapter, and this functionality can now be extended further by the use of enhanced network designs (Jaiswal and Kaushik, 2005) that can strengthen relationships with business partners and add value to customers. This growth in the functionality of ERP systems coupled with the increase in its enhanced network designs, plus the move into the SME market, all come together to make the implementation in to an organisation and organisational structure, such as the LTA and British Tennis, a viable option.

3.1.1. ERP Rationale and Alternatives

Clearly not everyone uses an ERP system and the research will demonstrate that there are a lot of different solutions in use across the landscape of British Tennis. The existing solutions range from existing ERP systems, including some integrated solutions, through to the use of spreadsheets, and even in one case a written ledger. What, therefore are the advantages and disadvantages of using an ERP system and, conversely, what are the advantages and disadvantages of not using an ERP system, and what are the available alternatives.
The advantages of an ERP system are numerous, as shown by framework provided by Shang and Seddon (2002c) which discusses the benefits under five major headings, with subheadings to expand on the detail. These advantages are discussed further on in the thesis but, in summary, they are operational benefits including cost reduction, and managerial, strategic, IT infrastructure and organisational benefits. The risks or disadvantages involved include delays in implementation, data migration, cost and resistance to change (Xu et al., 2002, Spathis and Constantinides, 2003). This is discussed further in the section on benefits and risks on page 36.

Integration in a large-scale organisation or extended network is hard and not to be underestimated. It is possible that the cost outweighs the benefits. It is also not without precedent that companies implement parts of ERP systems solutions and effectively “cherry-pick” the components that they require. The organisations may leave some of their old legacy systems in place either due to costs or to the new system not providing the required functionality. There are therefore alternatives to ERP systems, and there are three alternatives which have been put forward (Davenport, 2000) as options: these are best-of-breed systems, message brokering and object-oriented systems.

**Best-of-Breed Systems**

One of the most commonly used alternatives to ERP systems is installing a separate or standalone system (synonymous with a module in an ERP framework) which is best in the market and meets the requirements of the company in question. It may even be a single module from an existing ERP vendor. Davenport (2000) cites examples of companies installing the PeopleSoft Human Resources\(^1\) component in the belief that it is the best possible system for that application and they have not installed any other components. Although the PeopleSoft HR system is highly regarded, one of the principal benefits of installing an ERP module is that it integrates with other modules. This is not possible if only a single module is installed.

The counterview of ERP systems in that they do not offer the flexibility of a best-of-breed solution and that alternative options offer greater responsiveness to the business (Light

---

\(^1\) When Davenport wrote this PeopleSoft were indeed a significant best-of-breed software house; however in the interim they have been bought by Oracle.
et al., 2001). Light et al. also highlight the issue of Business Process Reengineering (BPR) and they claim that the opportunity for BPR is better matched to an ERP solution, as the best-of-breed approach has the ability to fit in with the existing processes. Whether this is true or desirable in every case is open to discussion but certainly ERP systems do impose a way of working that companies do need to adhere to, and making major changes to the system can be a major exercise due to the nature of integrated systems, i.e. because it is used by all and is a single copy of the data.

Other areas of concern about legacy best-of-breed systems might include redundant or inconsistent information, lack of integration, high maintenance costs, overlapping or duplicate systems, lack of ongoing support by the vendor, or because it has reached the end of the product life cycle (Davenport, 2002, p71).

What is important to note is that ERP systems do not cover all functionality and this would cover areas of extremely niche software (All-Mudimigh and Al-Mashari, 2001). Examples of this might include city-share-dealing desk software, specialist retail applications, hospital patient handling software, etc. In the specific area of this research the relevant areas would include tournament software and results recording and presentation.

In summary, the advantage of a best-of-breed solution is that they can be attractive to many as they offer a specific solution for a single area without the complexity of ERP. However, as the number of different best-of-breed solutions grows within an organisation, then the issues of data integration and the cost of maintenance may mean that growth and ambition of systems and innovation are very restricted.

**Message Brokering, Middleware and Object-Oriented Systems**

This is software that can talk to both the central and remote systems and will effectively provide a more real-time link between the two systems. This has the advantage of allowing the two organisations or business units to share data in a near-real-time fashion, but this is not without significant overheads in terms of CPU processing requirements, storage and database locking to ensure integrity which can cause significant performance degradation.

Current offerings in this area also include a modern concept of Service-Oriented Architecture (SOA). These frameworks or concepts attempt to circumvent the issue of data integration by offering a level of abstraction to the database layer. They therefore attempt to
present data to the application as if it were local, i.e. on the database within the application environment. An example of this would be Oracle’s SOA architecture (Oracle, 2009). Although SOA and message brokering are possible and are effective in certain circumstances, the number of organisations involved in this implementation would suggest that this solution is impractical. Additionally, it still does not give a central data hub or database, which is one of the major objectives of the single copy of the integrated data.

**Summary**

To summarise, there are alternatives to an ERP system but they would either be too costly or too complex to implement as in the case of a best-of-breed solution. In the case of an SOA, middleware or message brokering solution, it would not give the single integrated view of the data and not give the central hub or database required to generate the benefits described. Additionally, the organisational structure would make an SOA solution not practical to implement. The ERP solution provides a single database accessible from many entry points as well as multiple network access methods which can be mapped onto an organisational structure as described earlier.

**3.1.2. ERP History and Current Invocations**

ERP systems have been around since about the 1990s in their current form, i.e. in a form that is recognisable or contains a common set of modules that people would tend to associate as being an ERP system. This evolution is important to understand as it shows the underpinning of how the ERP phenomenon has come about, and how it is still evolving and growing today with the growth of new hardware and network technologies offering new functional opportunities.

However, the roots of these systems can be traced back to some of the very first commercially viable systems in the 1960s and 1970s. The three major steps that can be identified are:

- MRP
- MRP II
- ERP (and ERP II)
MRP and MRPII

Materials Requirements Planning (Kumar and Meade, 2002) was first used in the manufacturing industries and primarily seems to have been based in North America. It was developed for the material-planning process that used a product bill of materials (BOM) and a production forecast to determine future material needs and purchase timing. There were two environmental aspects which made MRP systems become a de facto standard during this period. The demand for consumer goods was at an unprecedented level in the post-war baby-boomer environment due to higher levels of disposable income, along with a new level of consumerism to fill the bigger homes with white goods, televisions and other luxury items. At the same time the IBM systems were also a common standard for large-scale computing. They had become more reliable, and the software to run the ERP systems was becoming commercially viable and available. The acknowledged developer of MRP basics was Joseph Orlicky (Chung and Snyder, 2000).

Whereas MRP was defined as Materials Requirements Planning, the next generation started to begin the task of integrating functions, and therefore the name changed to Materials Resource Planning II. Two main features dominated the new systems. One was that it encompassed more functional areas that were attached to or input into the system. This enabled a new model to be used as a basis, the ‘3C model’ – Capacity, Commonality and Consumption. This was developed by a need to support a “pull” manufacturing process, or a more demand-led process. It was felt that MRP would not support the twin goals of improving product availability and reducing operational costs.

The second feature was that these were all achieved on a technical architecture different from the original mainframe systems. They were developed on a “two-tier” architecture and utilised PCs for the first time, allowing a workgroup approach to processing. This had benefits and disadvantages, but ultimately led to more flexibility than the previous monolithic approach to group working. The thinking then was that in order to achieve increased integration benefits it would be necessary to add in further functions, e.g. Financials and Human Resources.

ERP and ERP II

This integration of the additional modules led to the evolution and realisation that other modules could be added. This also led to the next phase of the story and the development of
full-blown ERP systems. With an integrated ERP platform in place, a firm could build whole enterprise applications on top of it (Chung and Snyder, 2000). ERP II was a short-term definition to demonstrate the integration of concepts such as Supply Chain Management (SCM), Customer Relationship Management (CRM) and the integration of the web browser components. The term ERP II is no longer used significantly; the ERP term is used generically.

The use of CRM is a relatively new area that ERP vendors have moved into (Gupta et al., 2004) which they now term e-CRM. Gupta et al. highlight three phases of e-CRM:

1. **Sales Force Automation.** Including prospecting for potential customers, and general sales operations
2. **Enterprise Marketing Automation.** The objective is to optimise customer contacts.
3. **Customer Service Management.** This is the component where customer queries, complaints and general questions are dealt with.

**Application Service Provider and Software as a Service Models**

Application Service Providers are companies that purchase products, such as ERP systems and software, and deliver them to clients over the internet or private communications links (Trimi et al., 2005). The ASP will also hire the staff to operate, maintain and, optionally, develop the software, and can deliver systems expertise. All of these functions need not to be managed or employed by the client organisations, i.e. those who employ and manage the end-user community. Trimi et al. (2005) propose that cost savings can be gained from savings in hardware, software and personnel. In the context of this investigation, this means that using the ASP model, which would be run by the LTA, would enable small clubs and organisations to use functional systems without having to purchase hardware and software or to hire personnel in order to implement the systems. Trimi et al. (2005) identified that ASPs have become attractive because they offer lower costs and increased flexibility rather than installing systems with in-house personnel. This is true for both full and partial ERP implementations, i.e. clients can select modules as opposed to having to purchase the full ERP suite. Sigala also notes that the ASPs claim to remove the burden of day-to-day IT management by assuming total responsibility of application delivery, updates, ongoing maintenance and support (Sigala, 2004). This is consistent with the view by Trimi et al. (2005).

The ASP model proposed by Trimi et al. (2005) brings disadvantages due to the service, application and data being managed externally. The organisation involved therefore
has little or no control over service failures, confidentiality failure and performance issues. A separate study into delivering ERP systems through the ASP model also raised the concern of data security and availability of applications (Ekanayuaka et al., 2002). These are valid concerns and need to be addressed by the proposed framework in Chapter Seven. Currie (2004) also noted that customer adoption of the new business model was often not addressed by companies who were offering ASP systems. The ASP models referenced are not industry specific and none of the articles referenced highlighted any concerns about ASPs being relevant only for certain markets. This aspect is important to note in that it means that there are no obvious industry-specific issues as obstacles to using the model in a new industry sector such as sports and sports management.

The Software as a Service model builds on and extends the Applications Services Provider model which emerged from the Dot.com era. Although there is a reasonable amount of academic research regarding ASP models (Ekanayuaka et al., 2002, Currie, 2004, Sigala, 2004, Trimi et al., 2005), Software as a Service (SaaS) is considerably less well researched. Although there is no formal definition of either term, ASPs were concerned with providing the ability for organisations to move certain application duties to third parties. ASPs were not necessarily concerned about providing shared services to multiple tenants. SaaS providers are focused on providing applications that are designed for the web, giving improved usability and manageability. Salesforce.com is a good example, where there is a centrally hosted application but to the client it looks as if they have their own individual system with their own users and their own data. The system is completely secure and allows the hosting company to achieve large economies of scales by running many companies within the same environment.

**Summary**

The evolution of ERP systems is an important aspect of this specific branch of systems development. Although the term ERP II was a short-lived term for the development of ERP systems, it was an important evolution as it now embraces the key components of SCM, CRM and the browser architecture.

This evolution of the ERP model continued with the ASP model, where the service is provided by an outsourcing partner, thus reducing the requirement for expensive systems, software, hardware purchases and personnel costs. This model can be used by organisations of all sizes and the benefits can be realised by all, with the risks identified mitigated during the implementation.
3.1.3. ERP Concepts

At the heart of ERP systems there are several concepts that allow this technology to achieve the functionality and scope that it has. These are (Davenport, 2000):

- **Modular construction**
- **Client/server Architecture**
- **Configuration**
- **Common central database**
- **Variable interfaces**

Each of these areas is discussed in more detail in the following subsections:

**Modular Construction**

Enterprise systems are a collection of interrelated modules that can either be purchased separately or as a whole, depending on the sales and marketing strategy employed by the vendor concerned.

The ERP module listing is covered in the next section of the chapter. As mentioned before, the expansion of communications and communications systems and this new technology have opened up a number of opportunities for the value chain beyond the internal boundaries of an organisation, which has led to a significant change in the structure of entire industries (Anandarajan et al., 1998).

The modular design and integrated nature of an ERP system means that additional modules can be added on that are outside what may be conventionally thought of as a standard list. For specific functions that are unique to an industry or sector, these modules will need to be developed specifically (Shang and Seddon, 2007). In the case of this investigation the additional modules that will be investigated will concern the tennis-specific nature of the research, i.e. the use of tournament software, ratings and rankings systems, online booking systems, and other areas as they are identified during the investigation phase of the thesis.

**Client Server Architecture**

Modern ERP systems run on a client-server architecture, on which some part of the processing is executed on the server, and some part of the processing is executed on the client
or desktop computer. Some modern ERP systems run on what is known as three-tier architecture (Oracle, 2000). This is where the business rules or application logic are run on a separate layer in the architecture and their role is to communicate with the database layer. This means that a considerable load is taken off the database engines and the database engines and database itself can be tuned to run the database queries to an optimum level. This kind of architecture is typical where very large-scale applications are required, as multiple applications and database servers can be added in order to increase the capacity relatively easily.

This architecture is also typical of some of the larger websites and, in fact, it is quite common for ERP vendors to use a standard browser as the display interface, as is now an accepted standard on a high percentage of PCs. What this means in practical terms is that the application is available on every desktop, and is only restricted by the security protocols and firewalls in place to ensure that only authorised personnel can access the system.

The other requirement for the ERP hardware configuration is for it to meet acceptable performance criteria e.g. response times plus provide failover redundancy and a highly available service (Higgins, 2005).

![Three Tier Architecture](image)

**Figure 3: Three-Tier Systems Architecture**
**Extending the System Boundaries via Remote Access**

It is now commonplace and an everyday part of business life for people to be able to access data via the internet. What is less common is for information to be shared along the value chain and value network. What is clear from the literature is that the value chain approach of partnering with a group of entities can improve consumer satisfaction (Pitta and Laric, 2004), and competitive advantage via improved communication (Anandarajan et al., 1998) is of potential benefit to all.

This technology approach can be achieved by simple remote access to the central system via internet access, or by Virtual Private Network (VPN) which offers a more secure access to authenticated users. More sophisticated techniques of data sharing include such things as XML interfaces, web services and Extranets. These also offer workflow opportunities to automatically share cross-organisational information.

**Configuration**

The basic ERP system needs to be suitable for all companies and to do this it needs to be highly configurable. Typically this is achieved by a number of configuration tables that are updated by maintenance programs by the users themselves to set the operations as they are required. The number of configuration options is limited only by programming effort and they are typically set up during the implementation phase and only updated again due to a change in business requirements or processes. Configuration items would include VAT rates, period accounting rules, inventory accounting rules, etc. This approach is one of the key aspects of an ERP system and includes anticipated benefits such is avoiding ‘reinventing the wheel’, applying best practices, and minimising development and installation time (Al-Mashari and Al-Mudimigh, 2003).

N.B. ERP practitioners tend to differentiate between customisation and configuration. Customisation is where the base ERP code is modified, normally by a developer within the recipient organisation. Configuration is a fully supported activity by the vendor and the official way to tailor the software to the client needs; customisation is typically not supported by vendors and vendors will not accept calls to their central helpdesk for questions concerning modified code. Although the terms used can be interchangeable, it is incorrect to do so and they are used as per this definition in the thesis.
Common Central Database

At the heart of ERP systems is typically a relational database. The relational element of the name refers to mathematical relationships that Edgar Cod (Bradley, 1991) defined in his original database model. This is very closely aligned with mathematical set theory and essentially defines records or rows in a table. Within each record there will be columns or fields and these form attributes thereof.

The ability to seamlessly join tables to interrogate the database is one of the key strengths of a relational database. It is also very easy to write poor-performing SQL, and probably one of the key challenges of ERP systems is to ensure that the system performs at an acceptable rate for the user to perform business functions within a reasonable time.

Variable Interfaces

One of the strengths of the system for a multinational corporation is the ability to tailor the user interface to be able to display the local language and currency. All the translation is done by the user interface, although global products are likely to be in the language of the Head Office and the occasional error message may be in the language of the software developer.

3.1.4. ERP Modules


<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Financials</td>
<td>Cost accounting</td>
<td>Financial</td>
</tr>
<tr>
<td>Accounts payables and</td>
<td>Accounts receivable</td>
<td></td>
</tr>
<tr>
<td>receivables</td>
<td>General ledger</td>
<td></td>
</tr>
<tr>
<td>Asset management</td>
<td>Fixed assets</td>
<td></td>
</tr>
<tr>
<td>Cash management</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost accounting</td>
<td>Accounts Payable</td>
<td></td>
</tr>
<tr>
<td>-----------------</td>
<td>------------------</td>
<td></td>
</tr>
<tr>
<td>Financial consolidation</td>
<td>Budgeting</td>
<td></td>
</tr>
<tr>
<td>Profitability analysis</td>
<td>Inventory</td>
<td></td>
</tr>
<tr>
<td>Profit centre analysis</td>
<td>Costing</td>
<td></td>
</tr>
<tr>
<td>General Ledger</td>
<td>Budgeting</td>
<td></td>
</tr>
<tr>
<td>EIS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HR/payroll/personal planning</td>
<td>Payroll</td>
<td></td>
</tr>
<tr>
<td></td>
<td>HR/planning</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Recruitment</td>
<td></td>
</tr>
<tr>
<td>Operations and logistics</td>
<td>Logistics distribution</td>
<td></td>
</tr>
<tr>
<td>Inventory management material</td>
<td>Inventory/warehouse management</td>
<td></td>
</tr>
<tr>
<td>Plant maintenance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Production planning</td>
<td>Scheduling and</td>
<td></td>
</tr>
<tr>
<td></td>
<td>WIP/Forecasting</td>
<td></td>
</tr>
<tr>
<td>Project management</td>
<td>Project management</td>
<td></td>
</tr>
<tr>
<td>Purchasing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shipping</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sales and marketing</td>
<td>Sales and marketing</td>
<td></td>
</tr>
<tr>
<td>Order management</td>
<td>Order</td>
<td></td>
</tr>
<tr>
<td></td>
<td>processing/management</td>
<td></td>
</tr>
<tr>
<td>Pricing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sales planning and management</td>
<td>Forecasting</td>
<td></td>
</tr>
<tr>
<td>Quality management</td>
<td>Quality</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Data model</th>
<th>Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintenance engineering</td>
<td>Job evaluation</td>
</tr>
<tr>
<td>Resource MIS</td>
<td>Strategic planning – materials</td>
</tr>
<tr>
<td></td>
<td>• New product</td>
</tr>
<tr>
<td></td>
<td>• Product pricing</td>
</tr>
<tr>
<td></td>
<td>• BOM</td>
</tr>
<tr>
<td></td>
<td>• Long-range forecasting</td>
</tr>
<tr>
<td></td>
<td>• Engineer change</td>
</tr>
<tr>
<td></td>
<td>Collaborative commerce</td>
</tr>
<tr>
<td></td>
<td>E-business</td>
</tr>
<tr>
<td></td>
<td>Supply chain</td>
</tr>
</tbody>
</table>

The combined list highlights (in red) the areas of overlap and the text in black is where the item is only in the one list. The list by Payne (2009) is a very high-level approach which lists just six areas, whereas the Rao listing (2000) takes a very much more granular approach down to some very specific manufacturing modules e.g. engineering change management. The list by Payne (2009), however, highlights the web enablement and collaborative nature of ERP and he also refers to this as ERP II, as described earlier in this chapter. This reinforces the ERP II, including Customer Relationship Management (CRM) and Supply Chain Management (SCM) modules (Shang and Seddon, 2002a, Ramdani and Kawalek, 2009).

The modules that are incorporated in the combined list are important to establish in order to understand what modules would be used as part of the overall framework for British Tennis. The manufacturing aspects of the systems are clearly not appropriate for the purposes of this study and have therefore been excluded.

As shown in the module framework discussion in the previous section

The proposed list therefore is:

i) Sales and Marketing (including membership/customer registration)
ii) E-Business
iii) Financial
iv) Additional specialised modules to be integrated

3.1.5. The Extended and Virtual Enterprise

The five elements discussed in the previous section give the technical description of an ERP system which has been broken down into the base components. This section reviews the network components and the opportunities for extended access. The network aspect is not an integral part of an ERP suite but is an enabler to access the system. Without a network, the system is simply not available.

Four common access methods are:

1. **Remote access to an ERP system.** Employees of the organisation can access the information normally, as if they were in their normal office. This may be by Internet VPN, dial-up or unsecured internet (not recommended).

2. **Extranet.** An extranet is where external suppliers can access the system and see a restricted set of information, but up-to-date, immediate data.

3. **Collaborative Networking.** This is an extension of the extranet proposition where suppliers, vendors etc can access the same system and share data to improve supply chain, customer and order information, etc.

4. **E-Commerce.** Access to the ERP (or integrated database) system for customers. This is similar, in concept, to an Extranet but extends to the public internet. Examples include web-tracking for postal services, order tracking for online ordering systems.

Jaiswal (2005) reviewed a company which “extended its ERP system to establish transactional and relationship-oriented Business Network Systems (BNS) and has achieved significant improvement in business performance for all partners in the network. It has achieved significant reductions in inventory, improvements in cash management, and a negative working capital due to improved information flows across the network…” Although this study focused on a product-based as opposed to a service-based company, the principles of improved data and information flow will help all partners in the network to shorten order cycles and improve data accuracy and speed.

This does open up areas of concern that internal systems do not have an issue with – crossing the inter-organisational boundaries – and some trading or information partners do not
like to reveal their inner workings (Nickerson, 2005). Nickerson also goes on to say that the current ways of thinking need to be expanded into the logical channels of communication. That is to say that the current touch points between organisations can provide automation for any number of data sharing opportunities.

This concept is expanded further by Bititci et al. (2004) in their discussion on collaborative networks. They define the collaborative network as: “a distinct mode of organisation in which participant organisations work together in equity, commitment and trust exchanging information, sharing activities and resources and complementing and enhancing one another's capacity for mutual benefit and a common purpose by sharing risks, responsibilities and rewards”. This definition seems very appropriate to the research where we have already seen a number of organisations defined with a common purpose. The issue of trust between organisations is discussed further as part of the issues raised as part of the power and politics in sport on page 131. However, this is the same issue under the heading of collaborative networks mentioned above. Their research identified four areas of added value transactions for collaborative networks:

i) Shareholder value. Important for commercial organisations but less important in this scenario.

ii) Individual value proposition – the value of each member to its end customers.

iii) Intra-network value proposition – the value of each member to the overall network.

iv) Network-value proposition – the value proposition of the network to external markets.

This is a function of the combined competencies and capabilities of the network.

Bititci et al. (2004) summarise by saying that collaborative networks can create new and unique value propositions by complementing, integrating and leveraging each other’s capabilities and competencies. This description fits well with the aims and objectives of the organisation identified thus far as the organisations reviewed as part of the previous section all need to complement, integrate and leverage to some degree or other to deliver the threefold objectives of the sport.

3.2.6. ERP System Benefits and Risks

Davenport (1998) states that one of principal allures of an ERP or integrated system is to resolve or reduce the fragmentation in large business and by extension across the value chain. He says “the information is spread across dozens or even hundreds of separate computer systems, each housed in an individual function, business unit, region, factory or office”.

Page 36
Davenport (1998) was specifically talking about single organisations but the extension of the model is increased along the value chain. This would also imply that the reward could be greater increased as well by having a single solution which could help many clubs and organisations in tennis.

Davenport (1998) also highlights the reduced costs involved in storing multiple copies of the same data in many different places and different forms, all taking up resource both in terms of people’s time to support and the cost to maintain. The fragmentation also leads to delays in the updating of information needed by other organisations. The example cited is where the sales and marketing are incompatible with the financial position, so it takes a lot of time and effort in order to report an accurate company financial profit and loss account or balance sheet and hence its cash flow position and profitability.

Appendix B also gives a very comprehensive list of benefits (Shang and Seddon, 2002c). This list was compiled using information from a significant amount of vendor success feedback and also a number of follow-up telephone conversations. As is commented by Ferran and Salim (2008), this provides an excellent checklist of benefits that have been accomplished in organisations using ERP systems. It is also cited by Murphy and Simons (2002) and Gable et al. (2003).

This breaks down into five broad areas:

- Operational benefits: cost reduction, cycle time improvement.
- Managerial benefits: improved information for decision making, better resource management.
- Strategic benefits: support for business growth, innovation, leadership and differentiation.
- IT Infrastructure benefits: cost reduction in infrastructure, improved capability and flexibility.
- Organisational benefits: empowerment, shifting work focus, building common visions and increased employee morale and satisfaction.

This list breaks down into 25 different subheadings under the five headings and then further categorisation under each of those subheadings making this a comprehensive list of potential benefits. For the purposes of this research there are some benefits of this framework that require highlighting. Specifically these are:
• Labour cost reduction in running a single system that supports many users, as opposed to many systems and the inherent labour and infrastructure costs that are associated with them.

• Cycle time reduction: not in the conventional sense as cited by Shang and Seddon for order fulfilment, billing, delivery etc, but for the tournaments results and ratings and rankings and up-to-date reporting.

• Enabling e-commerce to attract new customers and expand into new markets. In this case the goal is to increase the number of people that the LTA have registered on their user database. Currently this is likely to be a few thousand at best and far short of the 3-4 million people who play tennis on an infrequent or a regular basis.

• Improve the cost effectiveness of the IT infrastructures. The SaaS framework provides a tremendous cost benefit to the hosting organisation as opposed to running many smaller and harder-to-maintain systems. This will improve the cost of maintaining and integrating legacy systems, system upgrade and maintenance plus system modifications.

• Building a common vision. The idea of having a single system to support and maintain the operational player base of all the clubs would allow a single vision as an objective and would obviate the need for clubs to research, select and install their own systems. There are other benefits that are cited by Shang and Seddon (2002c) and they will be raised as appropriate during the course of the thesis.

From an operational perspective Spathis identified benefits concerned with accounting practices with ERP systems implementations (Spathis, 2006). These operational benefits that he identified were across a number of areas, the relevant area for this research being the reduction in time for reconciliation and closure of accounts. This reduction in cycle time is due to the integrated nature of the database which would be effective in any aspect of consolidation and reporting such as might be applicable in consulting tournaments results. This reduction of cycle time in processing end-of-period processing also incurred infrastructure benefits due to reduced processing times and commensurate reduction in resource usage.

ERP systems are designed to provide “one common source” of data (Amoako-Gyampah, 2004). This one source means that data duplication and inherent inaccuracy of different data in different systems are eliminated. In the above research, the user-managers felt that the new ERP system would bring productivity benefits by ease of use improvements. One
of the other areas of managerial benefits highlighted in the research was the area that they designated ‘shared beliefs’. This they described as the ability to provide a unified view of the pulse of the organisation from a business perspective, and a belief about the overall impact of the system on the organisation with regard to its benefits. There was, however, a difference in the research between the perceived benefits highlighted by managers and end users.

Amoako-Gyampah (2004) recognises that it is important for managers to be aware if different members of the organisation have different perceptions of the benefits, and it is therefore important to develop different mechanisms, such as communications, to minimise this gap. This aspect is especially important to recognise in the context of this research. The benefits of an ERP system must be recognised by the managers and end users in the environs of the organisation, and in this area of research the benefits must be communicated to other parties. The additional complexity identified by this implementation framework is the number of organisations that would be users of the system (shown in Chapter Two).

In a study by Esteves (2009) which focused specifically on the SME market, he highlighted the fact that SMEs are upgrading their legacy systems to ERP systems according to META research analysts (Esteves, 2009). In this analysis Esteves uses the Shang and Seddon (2002c) classification above to review benefits. Esteves (2009) further classified the benefits also in terms of a time dimension. He identified three stages which he called: Stage 1 – stabilise; Stage 2 – synthesise; and Stage 3 – synergise. In terms of a time line they are within the first 3-9 months, 6-18 months and 12-24 months, respectively. As a summary he found that the operational benefits were realised within stages 1 and 2; managerial benefits also in stages 1 and 2; strategic benefits in stages 2 and 3; infrastructure benefits in stages 1 and 2; and organisational benefits in stages 2 and 3. The conclusions of this study show that the benefits realisation changes over time and should be considered a continuum as opposed to a one-off exercise which captures experiences and lessons learnt. The important aspect of this analysis is that the Shang and Seddon (2002c) benefits listing in found to be an effective tool as a theoretical foundation of the Esteves (2009) study.

Other ERP implementation issues highlighted (Spathis and Constantinides, 2003) include delays in implementation, employee resistance to change, data migration, training, increased costs, and friction with senior management. The issues of change management, training and delays are also identified as issues by a separate study (Kim et al., 2005) which also identified lack of functionality for existing business processes and system complexity.
The data migration issue was highlighted as a specific issue (Xu et al., 2002) and was broken down into further issues of resolving multiple data sources, incomplete data, timeliness of data, changing data and large amounts of data. With this specific investigation there were only two companies surveyed and they both involved SAP implementations which may therefore create SAP specific issues. They also identified training as one of the basic issues behind the data quality issues.

These risks will need to be managed as part of the implementation planning process of a large-scale implementation and actions identified included as part of the ERP framework.

**ERP Benefits versus Non-Adopters**

One study focused specifically on the output benefits of ERP systems (Hitt et al., 2002) versus a benchmark of companies that did not implement ERP systems (non-adopters), in an attempt to understand the economics of ERP implementations and contribute to the understandings of large-scale systems projects. They were given access to the list of SAP customers, which they matched against existing financial information databases. Overall they found that ERP adopters found greater performance in terms of sales per employee, profit margins, return on assets, inventory turnover, asset utilisation and accounts receivable turnover.

All these increases were found to be significant and were based against benchmark data for non-adopters of the software. Specific limitations, the authors raised, with this research are that they only cover a single vendor; this means they miss adoption of competing ERP packages in firms. Secondly, due to the data availability, they have focused on large publicly traded firms and the results may not generalise to smaller firms. Lastly, they raise the issue of omitted variables and reverse causality. There are numerous factors that can affect the firms’ performance and common areas might be a change in the CEO or members of the senior management team which can affect stock price and strategic direction.

Noting the comments above, it is a unique and astonishing piece of research, as it demonstrates a quantifiable link between ERP implementations and overall company performance using organisational financial data from large-scale companies.

Davenport (2000) also identified several tactics or guidelines for benefits realisation which organisations could adopt to ensure that the implementation is successful:
• Do not view going live as the end goal or the end of the project. Although this is very tempting from an organisational perspective, what it doesn’t take into account is the actual benefits realisation and measurement. Willis et al. (2002) identified two phases in an ERP implementation: phase one is the implementation component where there is little or no benefit to be identified; and phase two is the operational part, where tangible benefits should be realised. This is consistent with the Esteves (2009) and Shang and Seddon (2002c) research. However there are ongoing support and upgrade costs which an organisation will incur. An ERP system once implemented is not a static entity and it will require change as the firm changes.

• Deduct ERP-related savings from budgets. In order to realise the planned savings from the implementations the central functions should amend the functional budgets or headcounts from the relevant budgets once the system is live.

There is also evidence that, when a company realises benefits by improving the overall performance of the company, then this will influence the future IT plans of the organisation (Hasson and Saeed, 1999).

One of the issues of measuring the benefits of any IT system is that there is no consistent measure of what is success. There are many different models (Buttle, 1996, Whyte and Bytheway, 1996, DeLone and McLean, 2003, Venkatesh et al., 2003, DeLone and McLean, 2004) but they all take different approaches. The DeLone and McLean model provides a simple model that has a significant amount of academic research and has been revised and updated by the authors based on critical input. Its three main inputs (see Figure 4) are system quality, info(-rmation) quality and service quality.
The DeLone and McLean IS Success model, by their own admission, does have a significant academic background of review and applied usage in the field. From a simplicity point of view the model is intuitive and succinct. The flow of arrows is easy to understand and, whether this is causal or temporal, it is still straightforward to implement and to follow a logic through to perceive a net benefit. The use of the measure of net benefit is in itself a simple concept to understand and takes into account a large number of variables in order to ascertain an overall value. The classifications of System, Info and Service quality will be used as the basis for evaluating the effectiveness of the existing systems later in the research.

**Costs**

Enterprise systems costs tend to fall into three distinct areas (Davenport, 1998): the software, the hardware and the people.

The software costs include the licenses paid to the software vendor for the software itself, the ongoing maintenance costs, which may or may not include upgrade costs, and any support costs. There are many different licensing options which companies use and they might be by user (either concurrent or per seat), or by module i.e. the company might purchase the finance and inventory modules, but not the HR module.
Additional software costs may include additional bolt-on applications. Applications such as Business Objects and Cognos provide tools that allow end users to quickly prepare reports either direct from the live database or, more commonly, from a copy database. This can be in addition to the ERP systems installed reporting tool, or can replace them altogether.

The hardware to be implemented will include the infrastructure to run the application software itself and this will also include software costs for operating system components. In a three-tier environment there will be a tier for the databases servers, one for the applications servers and one for the end-user PCs plus there will also be the costs for the Local Area Network (LAN) connectivity (Davenport, 2000). The costs for the data centre box connectivity will need to include high-end specification devices, as the three-tier architecture (discussed more fully in the section on page 29 – Client server architecture) generates a lot of data-centre traffic, and slow connections at this point will cause performance problems. There will also be a need for devices such as firewalls for security, high-speed routers, as discussed above, and with the need for multiple servers there is also an option to install devices such as load balancers, which allow for sophisticated algorithms to spread incoming traffic across multiple servers. It is also not uncommon with a major implementation or upgrade for the end users’ computers or desktop PCs to need upgrading to make sure that they are able to perform to agreed service levels.

Once this is all in place then there is a requirement to ensure business continuity. There are a number of solutions for disaster recovery for major systems failures, and one solution would be to duplicate the entire system elsewhere, and put in place a method of replication, so that the second site can take over if the first one fails. Other solutions include third-party disaster recovery specialists, who provide a service which is effectively an insurance policy and will provide servers, data centre services and, optionally, call centre seats.

The last set of costs tends to be the most significant of all. These are the implementation costs especially in the short run (Lindley and Topping, 2008), which will comprise the configuration effort to match the system to the organisation, install it on the system and to bring about the organisational, behavioural and strategic changes which really make an ERP implementation effective. Most companies do not have the internal resources available to do this themselves, either because they do not have the experience or expertise, or from a or from a workforce capacity perspective.
This cost should not be underestimated and is likely to be in the order of three to four times the costs of the licenses (Enterprise Ireland, 2005). Reasons for this include “architectural complexity, the quantity of interfaces, level of customisation required, data transfer and report customisation”. In general, the principle to keep costs down is to reduce the level of change and complexity of these components. The effort also needs to include the amount of time and resource which the existing people within the organisation need to give to the project. This may include secondments, which could also include costs for the backfilling of positions or part-time involvement. In addition there are the training costs associated with the implementation (Lindley and Topping, 2008). It is important that nearly everyone in the organisation understands at some level the implementation, and obviously the key operators of the system will need several days’ training in order to operate the system effectively.

As an example of costs (Viehland and Shakir, 2005) a company which is a distribution concern in New Zealand which had 300 employees and distributed products to a large number of retail outlets decided to change its systems to JD Edwards ERP software. The approximate cost was $3 million, of which the breakdown was $700k in hardware, $500k in software, and the remaining $1.8m in implementation costs. The whole process took approximately four years, during which time the company experienced a major restructure and a change of senior management. A lot of the cost overrun was attributed to the fact that they initially believed they could implement the software without customising it, and without major change to the business processes themselves. In reality a great deal of customisation was undertaken and a number of processes were amended as a result.

It is important to identify the risks involved in a large ERP implementation. One of the more publicised cases\(^2\) was that of the Foxmeyer Drug company (Scott, 1999) which cited problems with an SAP implementation that caused the company to go into administration. Whilst it is out of scope of this research to identify whether that was indeed the case, or whether the software was used as a scapegoat of other failings in the company, there is no doubt that a poorly implemented ERP system (or IT system of any sort) will have potentially damaging implications for the company, and the risk associated with an implementation of this nature should not be underestimated.

\(^2\) It is likely that there are more ERP failures than are publicised due to the reticence of companies to publicly admit problems as it may well affect share price and investor confidence.
3.2.7. ERP Case Studies

This section highlights two specific case studies which demonstrate two different aspects of ERP systems implementations and demonstrable results. The first study reviews a Danish publishing company who identified a customer loyalty issue and used a CRM programme to improve its circulation and commensurately its revenue. The second case study is a review of an implementation of SAP R/3 into a manufacturing organisation.

CRM Case Study

The author of the case study (Lindgreen, 2004) researched the design, implementation and monitoring of a CRM programme within a single company over a period of four years. The company which was the subject of the research was a leading Danish business daily with an approximate daily readership of 239,000, while 480,000 people read it at least once a week. The company followed a process of:

1) Situation report
2) Analysis
3) Strategy formulation
4) Implementation

Also included in the project were areas such as commitment of senior managers, employee motivation, management development and loyalty-building processes.

As part of the analysis phase the company involved realised that it had a significant problem with customer loyalty, losing up to 40% of new customers and 70% of relatively new customers. The marketing revenue was geared towards these customers. As part of the strategy formulation and implementation the company decided to set up activities that would be directed toward the individual subscriber and ensure a one-to-one dialogue. As part of this activity a central project was set up to upgrade and improve the company’s database and CRM facilities. One aspect of this one-to-one dialogue is for the publisher to follow up each subscription when the date of renewal approaches. The company took the decision to increase its subscription period to one year instead of three to six months. Although the overall number of new subscriptions fell, the retention rate of the one-year subscribers became much higher.

In order to demonstrate the improvement over the four-year period, the company concerned increased its circulation by 40% and advertising revenue by 50%, while total revenue more than doubled. Whilst the case study shows that the improvement in financial
performance is not under dispute, one would have to attribute this as much to the management of the company as to the CRM processes and the software used to implement the changes. Systems are implemented and run by the people in the organisation and, although in this instance they said the data showed clearly where the problem lay, it was up to the senior management to identify the problem and take action to improve the existing situation.

Small and Mid-Size Implementations case study

Muscatello et al. (2003) investigated the implementation of an ERP system into four independent companies. All of the four companies were divisions of a larger company, and they represented a range of companies with an average of approximately $100m revenue turnover. Each of the companies had different prior experiences with manufacturing and IT. Each of the firms had previously encouraging experiences with ERP systems and was therefore “favourably disposed” to this approach. They all viewed integrated systems as a means to improving efficiencies and communications between the divisions and with their corporate headquarters. All the companies in the case study had considerable executive management support, which is cited as one of the critical success factors by Bingi et al. (1999) and Kamal (2006), although at Company D the sponsorship was at a lower level in the organisational hierarchy than at the other three organisations.

The study was able to review the company performance as a result of the ERP systems implementation and includes a comparison of the four companies. Companies A and B demonstrated a significant improvement in on-time delivery and performance compared with the pre-implementation information. They also reported a 5% improvement in market share, which was a significant increase. They both reported a successful implementation of the ERP modules, including successful integration, i.e. no longer requiring multiple entries of the same data, thereby reducing time and effort and the need for reconciliation across independent systems. Companies C and D had partial implementations, focusing on accounting modules, with company C adding inventory components. Companies C and D did not achieve the same results as companies A and B and in a number of instances were not able to measure improvements, which in itself is indicative of the lack of information available for financial analysis. The researchers (Muscatello et al., 2003) summarised by saying that companies A and B paid considerable attention to all activities, including financial and strategic objectives, which is consistent with the senior management focus mentioned above as one of the ERP CSFs. Company C was criticised for the unwillingness of executive management to manage and monitor the implementation process after the planning stage. Company D was additionally
criticised for the “gross mismanagement” of the entire implementation process – quite a damning statement.

**Summary**

In the second study both Companies A and B had good management support and successfully implemented the ERP modules for their organisations and as a result saw significant improvements in their companies’ performance. However, both case studies have aspects that are applicable to the overall proposal. The first study highlights the increase in revenue and turnover due to the focused CRM activities brought about by an improvement in subscription levels. Meanwhile, the second study improved productivity due to the single entry of data and the reduced effort of reconciliation across the independent systems.

The case studies show that an implementation of this nature is not without difficulties but overall was seen as beneficial and effective. In the second study however, Companies C and D however did not see the same improvement which can partially be attributed to the fragmented approach to the number of ERP modules, the approach and involvement of senior management and in the case of company D, sheer competence levels.

**3.2. Critical Success Factors**

It is important to recognise the critical success factors in the use of technology. Clearly, systems (hardware and software) are developing at a pace which makes it feel like technology is changing on a daily basis. It is therefore crucial to identify the critical success factors involved in the take-up of new technology that will make the new innovation a success.

**3.2.1. Critical Success Factors in ERP and Innovation**

Innovations in IT affect both the private and government sectors as both entities are trying to achieve their own specific goals, and IT adoption provides the capability for each to achieve them. The benefits to an organisation include operational, managerial, infrastructure and organisational advantages (Shang and Seddon, 2002c) which will include both tangible benefits which are quantifiable in revenue, cost and resource terms, and also in non-tangible benefits which are also referred to as soft benefits. This is where they are not able to be quantified but have some intangible benefit to the organisation.
These benefits might be blatantly obvious to all concerned; however, this does not mean the technology or innovation is going to be successful, and there are a number of critical success factors which are involved in the development. Two main distinguishable phases have been cited with regards to organisational adoption, these being the initiation and the implementation stages. Kamal (2006) cites Gopalakrishnan and Damanpour (1994), stating that the adoption decision takes place between the initiation and implementation phases. He goes on to say that the initiation phase allows the organisation to become aware of the idea, form an opinion towards its acceptance and further evaluate it. Once the decision has been made, and the authors do not say whether this is explicit or implicit authorisation, then the acceptance or assimilation within the organisation becomes important. This view does take a rather narrow perspective of IT innovation, in as much as it assumes that it is internal to the company or organisation. The marketing and CRM capabilities referenced assume that these innovations can occur within an organisation, but they can also affect external customers and other organisations, as discussed earlier in the chapter, in the use of extended networks within ERP implementations (Jaiswal and Kaushik, 2005). This use of extended networks and ongoing advances in technology (Kamal, 2006) are adding complexity and uncertainty to the organisational environment. The author goes on to say that this step change in system technology calls for a major reappraisal of the organisation’s structures, which were designed for yesteryears. This viewpoint is also reinforced by Kyle (1997), who reviewed the use of systems in sport, where he was looking at systems from a more generic viewpoint, but concluded that a coordinated, integrated system is required to sustain excellence in sport and that this system did not yet exist in the UK.

Kamal (2006) has identified a number of CSFs through case study analysis and literature review that are specifically pertinent to government organisations or agencies. CSFs that are critical to the success of ERP implementations have also been identified. This section compares the two models in order to identify a common set of factors which apply to both innovation in the government sector and to ERP implementations.

The factors identified by Kamal (2006) are administrative authority, financial support, managerial capability, management style, complexity, compatibility, market knowledge, size, coordination, IT capability, championship, external forces and collaboration.

Some elements of the 13 CSFs of innovation which affect the adoption of IT in the government sector can also be seen in the CSFs affecting the implementation of an ERP.
system (Bingi et al., 1999). The key elements that Bingi et al. identified that overlap with Kamal’s (2006) work are top management commitment, integration, implementation costs, and selecting the right employees.

To summarise the differences between the two CSF evaluations, it is useful to be able to visualise them in a table:

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrative authority</td>
<td>Top management commitment</td>
</tr>
<tr>
<td>Financial support</td>
<td>Implementation costs</td>
</tr>
<tr>
<td>Managerial capability</td>
<td></td>
</tr>
<tr>
<td>Management style</td>
<td></td>
</tr>
<tr>
<td>Complexity</td>
<td></td>
</tr>
<tr>
<td>Compatibility</td>
<td></td>
</tr>
<tr>
<td>Market knowledge</td>
<td></td>
</tr>
<tr>
<td>Size</td>
<td></td>
</tr>
<tr>
<td>Coordination</td>
<td></td>
</tr>
<tr>
<td>IT capability</td>
<td>Selecting the right employees</td>
</tr>
<tr>
<td>Championship</td>
<td>Top management commitment</td>
</tr>
<tr>
<td>Externals forces</td>
<td></td>
</tr>
<tr>
<td>Collaboration factors</td>
<td>Integration</td>
</tr>
<tr>
<td></td>
<td>Reengineering</td>
</tr>
<tr>
<td></td>
<td>ERP consultants</td>
</tr>
<tr>
<td></td>
<td>Implementation time</td>
</tr>
<tr>
<td></td>
<td>ERP vendors</td>
</tr>
<tr>
<td></td>
<td>Training employees</td>
</tr>
<tr>
<td></td>
<td>Employee morale</td>
</tr>
</tbody>
</table>

Table 3: Comparison of CSF for Innovation and ERP systems.

Of the Bingi (1999) elements not referred to in the Innovation CSFs, two are clearly ERP-specific, i.e. the elements concerning consultants and vendors. Arguably the reengineering element is also ERP-specific as it is concerned with changing processes to be
more streamlined and efficient, although process innovation is something that would be highly desirable in the government world. The element of training highlights a weakness in the Kamal (2006) model, as training in new innovation at the implementation phase is a key component of success. Whether it is training in creativity itself (Bono, 1992) or in the implementation process (Davenport, 2000) it is extremely important to the process of acceptance or “buy-in” by the workforce, either in the public or private sectors. In fact, Kamal (2006) himself does make the point that “simply acquiring or adopting a technology is not sufficient — in order to obtain the anticipated benefits, IT must be deployed and used appropriately by the organisation and its intended users.”

**Innovation**

Innovation is a hard concept to measure and define (King, 2000). One definition is that there is a fundamental change in a significant number of tasks. A second definition uses the criterion that the innovation be “state of the art”. Whether the innovation uses new technology or not, both definitions clearly require some significant change to current operation. Certainly the Mini Tennis initiative falls under this bracket as it is a new way of doing something, has been widely accepted and has been well received and successful. It is harder to find the same innovation in the IT world; the original Totaltennis concept could well fall under this category, but without notable success. Totaltennis is discussed in more detail in the section on Power and Politics in Sport on page 131.

There is a noticeable overlap between innovation CSFs and the notes on power and politics in the previous section. Kamal highlights both administrative authority and financial support as being key to the size of innovation that we are discussing. In the same way that the value chain structure has no single entity with direct control over the use of IT systems, the level of innovation is directly affected by this as well. Although it is easier to develop innovative systems with lots of financial support and a management structure that has control over the end users, it is not impossible to do so and the level of adoption will depend on other factors involved in the initiative. These items would include areas such as managerial capability, complexity, compatibility, market knowledge, coordination, championship, and external forces.

We have seen from the results section that the LTA can innovate, and do so very successfully in some areas. Specifically, these areas are concerning tennis operations, e.g. Ariel Mini Tennis. What is less obvious is the innovation within the technology areas. The
Totaltennis website initiative is discontinued and therefore it would be deemed not to be successful over the long term. This is at a time when the knowledge and understanding of website use, innovation and technical aspects are growing day by day. The need for the LTA to innovate, from a technology aspect, would seem to be more important than ever, or else it is going to be left behind. This would result in the LTA not being able to offer its customers the information or means of communication that they expect as a standard from dealing with either other sports bodies or commercial organisations. From an organisational perspective, the LTA does not even have a position for director of technology, which would suggest that it does not consider IT and technology as a priority, nor appreciate the future benefits to promoting tennis.

At this stage in the research it is not possible to say how effective or pervasive innovation is within the organisations identified to date, but a number of aspects such as administrative authority and top management commitment would seem to be common and these may be relevant to the final proposal.

3.2.2 ERP Summary

The use of ERP systems has grown significantly and they are now run in any number of major organisations. Options include running the entire enterprise, including many divisions and business units, as in the case of Nestlé and the SAP Globe project (Worthen, 2002), or simply taking some components or modules as they fit the best-of-breed concept as described previously on page 23. The modular concept has significant commonality with the value chain model, which is discussed more fully in the next section. This is also built on to show the relationships using the value network model.

Davenport (1998) highlights the major advantages of an ERP or integrated system being derived from the single database. This then allows the removal of lots of fragmented data sources, and the updates that were applied to many systems are only applied to a single record, making the information more accurate and timely. Other literature demonstrates the benefits and potential of ERP systems and the improvement to the bottom line of organisation (Hitt et al., 2002). It also draws attention to companies who have used it to extend the operation across the traditional boundaries and thereby open the operation to their partners in the value network. The case study of Jaisal et al. (2005) shows the benefits that can be found using the extended network approach across its business partners. This extends the work of Pitta and Laric (2004) and confirms the benefits of extended value chains and value networks.
IT is important to understand the structure of current ERP systems, as this underpins how the various modules of the software would be utilised in a model of the system and also in a live deployment of the system. This is identified in the sections covering the module construction, the client/server architecture, configuration elements, the central database and variable interfaces. These elements are what differentiate ERP systems from other IT systems and have been built on as demonstrated in the short history of MRP through to ERP and ERP II. How far these ERP systems can be extended is bound only by the market opportunities and the innovation of developers.

The five elements identified earlier also give the opportunity for the ERP system to be deployed or accessed from outside the organisation via an Extranet, or via a Collaborative Network. This extended-access model provides the theoretical basis for the usage of an ERP system by many different organisations within the same field.

The research question that needs to be addressed in this area concerns the existing software that is used by the various organisations. ERP offers a variety of modules and therefore the research question should investigate what is already in place, and provide a top-level assessment of the efficacy of the deployment. Hamel and Prahalad (1994) identified the concept of looking for “white space” between business units in order to discover new market opportunities. In a similar way the “white space” between systems and organisations needs to be identified in order to understand where the ERP opportunities and benefits lie.
Chapter Four: Using the Value Chain to model ERP Systems in a Multi-Organisational Context

Introduction

Chapter Two highlighted the organisations involved in the provision of British Tennis and gave an overview of their relative groupings. Following on from that was the review of the concepts of the modern ERP system, including the architecture and structure of how current systems are configured, the benefits and costs involved in a large-scale implementation, and a case study to show how these systems work in an applied environment. To bring these two sections together in a logical manner requires a model that demonstrates how they can be combined and that shows how a modern ERP system could be used in a new environment such as British Tennis. The model selected for this is Michael Porter’s Value Chain and Network (1985).

4.1. Rationale for the selection of Porter’s Value Chain (1985)

The number of options available in order to bring together to twofold requirements of mapping the organisations involved in the research and also the ability to integrate the technical and functional requirements of an ERP framework are limited. Porters model meets both these requirements and there are no alternative models that meet all the criteria as a research tool i.e. it can encompass a large organisational network, it maps the functionality of the organisation at a low departmental level, it has been used and applied to a number of industries and has been used and reviewed by the academic community as well (see references below).

Examples of research and applications to other industries include Bhatt and Emdad, 2001, Eustace, 2003, Prahalad and Ramaswamy, 2004, McPhee and Wheeler, 2006, Swafford et al., 2006, Yolmaz and Bititci, 2006 and, latterly, the model has been broadened to show extended value chains and value creation, as discussed further in Chapter Seven. Indeed it has been updated to show the use of the virtual value chain in the E-commerce environment (Bhatt and Emdad, 2001) and the role of intermediaries in the electronic value chain (Janssen and Sol, 2000). The value chain framework has also been used as a basis for investigation into the implementation of Extranets (effectively extended Intranets) and cost control (Anandarajan et al., 1998).
The model has also been extended further into tools such as the concepts of the Global Commodity Chain (GCC) (Gereffi et al., 2005) where the multinational aspects of the firm are investigated such as new factories or engineering centres are established in another country or multinational outsourcing are investigated. The model is mostly concerned with tracing the shifting patterns of global production, understanding how GCCs work and determining the roles that they play in rich and poor countries alike. This work, however, is still using the value chain as its basis and extending it out geographically. It is using the original concepts as espoused by Porter (1985). Gereffi et al. (2005, p6) note the similarities between the GCC and Porters Value Chain. They say that as their GCCs “Porters value chains show the benefits that firms derive in breaking the production process into discrete segments to help them look for innovative organizational and managerial practices to improve their productivity and profit.”

Whilst the GCCs cover some of the same areas as the Value Chain work by Porter (1985) as noted above, they are not applicable to be used for this research as the global aspects are not relevant and also the Porter Value Chain has been more widely applied to technology areas e.g. Extranets and industries with a broadly similar model e.g. Health Care by Pitta and Laric (2004) - see below).

Although first put forward in 1985, Porter’s Value Chain and Value Network have been used extensively in industry and academia alike. They have been criticised for being too focused on manufacturing, and Porter has updated the concept in a more recent article concerning the value chain and the Internet (Porter, 2000). In this article he offers six principles of strategic positioning in which point two says “a company's strategy must enable it to deliver a value proposition, or set of benefits, different from those that competitors offer.” The other point within the six is point three which argues that “strategy needs to be reflected in a distinctive value chain. To establish a sustainable competitive advantage, a company must perform different activities than rivals or perform similar activities in different ways.”

One study has also taken the value chain and mapped it to a specific industry, i.e. health care (Pitta and Laric (2004)). The Pitta and Laric model has been particularly relevant as it has provided an extended value chain model. This model has been used as a framework on which the LTA model has been mapped in order to show the interrelationships. This is shown in the original form for health care as in Figure 7 on page 58, and also in the updated form for the LTA and associated organisation and consumers in Figure 14 on page 139. The Pitta and Laric model (2004) was chosen as it uses the value chain as its basis and also groups
organisations based on similar tasks and entities. This is particularly relevant in the environment with a large number of entities, such as in British Tennis.

In summary, the model incorporates internal functions of the firm which can be surprisingly easily mapped onto the modules of the ERP system, as demonstrated later in this chapter. This correlation is important as it gives the basis on which to base the framework proposal which is discussed in more depth in Chapter Seven. It has been applied to a number of industries and has been researched and extended in areas such as the Global Value Chain and there is no viable alternative that meets the criteria as discussed above.

4.2. Value Chain Model

The value chain was first put forward as a model in the seminal work of Michael Porter (1985). He created a model of the various operations of an organisation which all go to create value for an organisation. See Figure 5: Porter’s Value Chain Model (Porter, 1985). The important aspect of the value chain is that each phase in the chain may create and add value to the product. It is this aspect of value creation or addition that differentiates the value chain from the simple movement of goods from one company to another.

Porter himself subdivided the model into two major divisions: The “primary activities” are those that make up the ongoing production (inbound logistics, operations, outbound logistics, sales and marketing and after-sales service). The support activities are equally important to the overall competitive advantage or “value add” to the organisation, consisting of financials, human resource planning, technology or IT, and procurement. The model has also been thought of as a cost basis model and as such the primary activities equate to the production costs and the support activities can be construed as coordination or overhead costs (Anandarajan et al., 1998).
The size and importance of the various aspects will change from organisation to organisation. Porter (1985) notes that a firm is more than the sum of its activities and that its value chain is an independent system of network of activities. These are connected by linkages, and these linkages can affect the cost effectiveness of other operations. Porter also updated his thinking on the potential applications in a later article (Porter, 2000) and highlighted web-based, distributed financial and ERP systems plus the potential online investor relations, information dissemination and broadcast conference calls. Careful review of these linkages and ideas can be a significant source of competitive advantage. Nortel required “integration and synergy between distributors and suppliers” and “they recognised the need to share information across boundaries as never before”. They view their ERP system in conjunction with the pervasive nature of the internet as helpful to enable this level of “external information access” (Davenport, 2000).

The analysis of these linkages has now included a statistical assessment of the agility of a company’s linkages and how they impact on the competitive advantage of that company. Two examples of an agile value chain are firstly in the area of shorter manufacturing lead times. The example given is that of Dell, where the company has demonstrated that shorter manufacturing lead times bring about improved customer service levels and, therefore, competitive advantage. The second example given is the ability to reduce product
development life cycle, giving first-mover advantage and enriched product variety (Swafford et al., 2006).

Whilst it is clear that the value chain is focused on the internal aspects of an organisation’s operation, the organisation does not operate in isolation from others in an economy, and this has been recognised both by Porter (1990) and by others (Pitta and Laric, 2004). Porter himself extended the idea of the value chain to this effect by the use of what he calls the value system – see Figure 6: Porter’s Value System (Porter, 1990).

The value system highlights the interaction of a company with other organisations in order to provide a product or service to a potential buyer. This can also have considerable overlap or synergies with the supply chain concept. External links can be as important as the internal links in providing competitive advantage. The Japanese innovation of Kanban, where deliveries are provided frequently and on a “just-in-time” basis, has mutual advantages in reducing stockholding and improving forecasting for the sending and receiving organisations. The disadvantage is that when the “slack” is taken out of the system, and if deliveries are delayed, then this effect can be felt immediately by the customer and therefore would impact revenue. Porter (2000) goes on to make the point that successful cost leaders do not only look at internal manufacturing costs, but also low-cost suppliers, low-cost marketers and low-cost service providers.

Value System

![Value System Diagram]

*Figure 6: Porter’s Value System (Porter, 1990)*
The value network is a value system where the interrelationships between organisations are more fluid than those in a value chain (Johnson and Scholes, 2002). The commonality, however, is that all the members share a similar goal and commitment to a particular product or service. This could include, but is not limited to, shared data, IT communications systems and protocols and, importantly, shared values and trust. New technology has the capability to disintermediate organisations in the value network for the provision of information to the end consumer. However, there is a discussion emerging that re-intermediation is now happening in order to add value to the end consumer (Nissen, 2000). The three elements that Johnson and Scholes (2002) highlight in their discussion on value systems are: delivering products/services that are valued; performing better than other organisations; and the robustness of the resources and competencies.

Figure 8 shows the value chain of two business units and the opportunity for organisations in the value network to be able to share information and functional systems. Porter (1985) showed the original concept using an example from a paper product organisation. The concept behind this linking of these systems could be developed further using the organisations as identified earlier in Chapter Two.

Figure 8: Value Network of Two Business Units

Figure 3: Participants and relationships in the health care value chain

Figure 7: Health Care Value Chain (Pitta and Laric, 2004)

The value chain and value systems have been used as a basis for further research into the interactions and operations of companies and have been modified to take into account detailed applications into specific industries such as health care (Pitta and Laric, 2004). There has also been research into more intangible areas such as knowledge management (Eustace,
and as an analysis tool into the use of Extranets for instance (Anandarajan et al., 1998). The Pitta and Laric (2004) model is especially interesting as it incorporates organisations from commercial and non-profit organisations and government agencies, as shown in Figure 7. The organisational grouping of the Pitta and Laric model (2004) identifies groups and individuals involved in the value network, groups them into manageable units, and identifies the organisational or data flow between them. What the model does not do is identify the various organisations’ contribution to the value chain. The model does not highlight whether the organisations have a strategic or objective setting responsibility or whether they have operational responsibilities in delivering a service to the end user or patient as in this case? The model also does not identify organisations that are central to the overall value chain, nor does it ascertain whether there are scale-free or hub aspects to the organisations listed.
Hearn and Pace (2006) posit that the chain metaphor creates a number of limitations. They suggest that it is a single linear process with one stage leading to another and that it does not recognise the fact that the value chain creation may be a competitive as well as a cooperative process. They suggest that the chain exists in isolation and ignores the environment as well as the effect of other processes or factors. Hearn et al (2006) reference the value ecology (as discussed in the following section) to highlight a more dynamic model that
is suited to the modern digital age of high-speed communications, where the consumer is more involved in the process and is raised to the level of co-creators of value.

4.2.1. Value Ecology

Although it is very convenient to draw the value chain as a simple linear diagram as in Figure 6, this does not reflect real-life situations. Pitta and Laric (2004) evaluated the value chain for the American health-care market, and they drew the connections in a manner that reflected better the logical flow and connections between entities and organisations – see Figure 7. However, as they point out: “the service chain can be very complex, forming a network of relationships, rather than a sequence customarily associated with the value chain …these value chains are neither linear nor sequential and they could be circular or iterative.” (Pitta and Laric, 2004). To reflect this advance in recognition in the real-world aspects of networks – not just value chain networks but networks of all descriptions e.g. the Internet connectivity, social networking etc – there is now discussion concerning next-generation business systems of value creating ecologies (Hearn and Pace, 2006). They recognise a shift in thinking in the field, specifically: shift from consumers to co-creators of value; shift from value chains to value networks; shift from product value to network value; shift from cooperation and competition to complex co-opetition\(^3\); and the shift from an individual firm’s strategy to thinking about the value ecology as a whole. Their critique of the value chain builds on the Pitta et al. (2004) comments, in as much as the value chain suggests a linear process with one stage leading to another; does not analyse the issues concerning a competitive as well as a cooperative process; suggests a mechanistic approach and static rather than dynamic linkages; and suggests that the chain is viewed in isolation and ignores the environment and external factors that may affect it. Therefore, the metaphor of a value chain is at once useful as a framework, but also limiting in that it does not reflect the dynamic nature of the participants and goals.

Hearn et al. (2006) cite that the value ecology model is a dynamic, multi-directional cluster of networks, and that these networks facilitate rapid information transfer across institutional boundaries to put people in direct contact with each other. They also point out that the new value creation is achieved with the manipulation of data, and with the characteristics of information from ordinary goods. Unfortunately, Hearn et al. (2006) do not go on to discuss that the value ecology is in itself an informational network, and that the end goal is a service.

---

\(^3\) Co-opetition a neologism coined to describe cooperative competition.
They tend to focus more on aspects of the transition of product value to network value. However, the ecology metaphor is useful to describe how value is generated as it:

i) emphasises the idea of networks or webs of relationships;
ii) suggests a holistic dynamic view rather than a static linear view;
iii) suggests that the generation of value does not just reside in the product itself;
iv) argues that competitive and cooperative processes are in interaction with each other;
v) encompasses the idea of an environment of factors; and
vi) opens the door to evolutionary metaphors to analyse change and development of the context of the business.

One of the main tenets of the Hearn and Pace (2006) paper was that there is a shift from consumers to co-creators of value. This has been made possible by the highly interactive nature of the Internet, where the consumer can get involved at different points in the value ecology and not just as an end-point consumer. The firm must innovate to enable a diversity of co-creation experiences, it must also allow individuals to co-construct and personalise their experiences (Prahalad and Ramaswamy, 2004). This idea of co-creation of value is not about outsourcing or a marginal customisation of existing products, but a fundamental change for the experience of the customer. This is the co-creation of value through personalised interactions that are meaningful and sensitive to a specific customer. The keywords in that sentence are the words ‘specific’ and ‘personalised’. This means the internet experience is a very much a personal portal approach, and is also interactive to give two-way feedback and product enhancement.

In the mid nineties networks were still rather rudimentary and expensive, but with the advent of the Internet these issues have largely fallen away and therefore issues with location access are no longer relevant (at least not due to technology reasons). The theory has been taken further with the concept of extended and virtual networks. The companies provide external organisations with access to their systems, for information giving or receiving in order to speed up the supply chain or order process, or simply because they offer a view of their data via a secure internet access port.

It is important to distinguish the different aspects of networking capability. Conventional wisdom suggests there are four major areas of external access, the reasons for them, and the target audiences:
1) **Remote access to an ERP system.** Employees of the system can access the information normally, as if they were in their normal office. This may be by Internet VPN, dial-up or unsecured internet (not recommended).

2) **Extranet.** An extranet is where external suppliers can access the system and see a restricted set of information, but gives them up-to-date, immediate data.

3) **Collaborative Networking.** This is an extension of the extranet proposition where suppliers, vendors etc can access the same system and share data to improve supply chain, customer and order information, etc.

4) **E-Commerce.** Access to the ERP (or integrated database) system for customers. Examples include web-tracking for postal services, order tracking for online ordering systems.

Bringing together the elements of e-commerce, service and value ecology is the Burn and Ash (2005) model for e-business transformation. Why this is important is that it highlights a path through to the realisations of value propositions, starting with technology and stage one integration, through to differentiation at the product and services at stage two, through to stage three which is the realisation of value propositions with virtual B2B interactions. Under the examples cited in the Figure 9 is the business network to design and leverage interdependent e-communities, which is dependent on the relationships between those e-communities. The model also shows that at stage three the outcomes and performance gains would be from a virtual perspective and also from a financial and economic value add perspective.
Table: Stages of e-Business Transformation (1999 -)

<table>
<thead>
<tr>
<th>Business Dimensions</th>
<th>Stage 1: Integration</th>
<th>Stage 2: Differentiation</th>
<th>Stage 3: Realisation of Value Propositions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Technology</strong> (virtual infrastructure)</td>
<td>* ICT ERP with e-Sales &amp; e-Procurement apps</td>
<td>Differential Resourcing ASP vs cost of ownership on the outsourcing spectrum</td>
<td>Innovative Technologies ERP and non-ERP networks for e-marketplaces</td>
</tr>
<tr>
<td><strong>Products &amp; Services</strong> (virtual experience)</td>
<td>e-Mails e-Mall integration and information exchange</td>
<td>* e-Branding Customisation vs standardisation, Brand identity &amp; integrity</td>
<td>e-Communities Foster customer, supplier, and employee expertise, Emerging collaborative online communities</td>
</tr>
<tr>
<td>Examples</td>
<td>Remote experience of e-catalogues. More tasks, “group ware” skills for online communication</td>
<td>Assemble and coordinate assets through effective use of online services</td>
<td>Business network to design and leverage interdependent e-communities. Dependent on relationships</td>
</tr>
</tbody>
</table>

Dynamic planning focus across stages of organisational transformation

<table>
<thead>
<tr>
<th>Strategic focus</th>
<th>Self-service</th>
<th>Empowerment</th>
<th>Relationship building</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planning focus</td>
<td>Internal SCM</td>
<td>External SCM</td>
<td>Community Networks of SCM</td>
</tr>
<tr>
<td>Outcomes and Performance Gains</td>
<td>Improved operating efficiency (ROI)</td>
<td>Effective resourcing (QWL)</td>
<td>Virtual and economic value added (EVA)</td>
</tr>
</tbody>
</table>

* The diagonal cells(shaded) represent the critical stages of eBT and the arrows represent real organisational transformation with e-business

Figure 9: Stages of E-Business Transformation (Burn and Ash, 2005)

The question for the research is how much the consumer is treated as the end point of the value chain. Or, specifically, is the tennis-playing public, at any skill level, involved in a value ecology fashion, given that they are customer, consumer and participant possibly all at the same time.

4.2.2. Scale-Free Networks

An investigation by Shulver and Lewis (2003) focused on the network perspective of a service industry, specifically retail credit banking. One of the elements they identified was the concept of a point of origin, or a “parent”. They cite that the concept of a network parent that
“wields a carrying degree of influence over the performance of individual operational nodes and can therefore create value through guidance, implementation of appropriate performance measures or specialist help. Conversely they can destroy value by excessive bureaucratic overheads or by giving misguided advice”.

This concept of identifying a parent in a network is analogous to the concept of value networks and the development of mathematical studies of scale-free networks. Scale-free networks grew out of the mathematical study of graph theory (Siegried, 2006). Whilst graph theory was good at describing static networks with nodes connected at random, it did not always match with the real world where networks change and grow, adding new parts and new connections, and where some nodes get more or less than their fair share of network connections. This skewing generated research into the power law aspect of network mathematics specifically recognised in an article concerning the science of networks by Barabasi (2002). The important aspect of scale-free networks is that they have a clustering effect or aspect which is not found in random networks. This can also be described as a small world property. The research into scale-free networks has important implications for business applications as well as for phenomena occurring naturally in nature.

Using the concept of a continuum, which showed at one end of the spectrum the linear-type diagram of Michael Porter (1985) showing a logical representation of the organisation connections and, at the other end of the scale, a random or any-to-any connectivity model between those same firms, then it is likely that neither of these would show a real-world situation. In order to understand the interrelationships involved in the research, the research methodology will need to identify the connections between organisations, and to examine examples of the data flows involved.

4.2.3. Value Chains in a Service Environment

It is much easier to identify the value chain as described above as being in the manufacturing arena as opposed to the services sector of industry. Words such as inbound logistics, operations and procurement clearly give the impression that the model is based on a production or manufacturing environment and is predicated on a physical flow of materials. The value system put forward by Eustace (2003) for knowledge management, as an example, “offers a parallel perspective by tracing the essential knowledge flows of the modern business organisation”. The knowledge value chain identified is shown in Table 4.
Table 4: Knowledge Value Chain (Eustace, 2003)

The purpose of demonstrating this model is twofold. Firstly, it demonstrates how Porter’s model has been used in other areas to demonstrate various aspects of organisational inter- or intra-relationships outside of the physical movement of goods. Secondly, the model has relevance in its own right for the purposes of this research.

The discussion from Eustace (2003) is to demonstrate the shift from tangible assets of competitive advantage to the non-tangible assets. The four segments taken from left to right go from the “softer” side of organisations, where the intangibles are hard to quantify but give a potential for competitive advantage and value to the consumer. Eustace describes the latent capabilities of a firm as “a reservoir of potential talent and innovation that provides a main source of future competitive advantage and earnings. Collectively, these attributes provide a leading indicator of the organisation's ability to respond to market threats and opportunities that are as yet unknown, and often unknowable.” If one were to paraphrase this then it could be summed up as “if a firm has quality people with good ideas then this is a source of potential which is of interest to stakeholders, investors and value-add to the consumers alike”.

<table>
<thead>
<tr>
<th>Latent Capabilities</th>
<th>Intangible Competences</th>
<th>Intangible Goods</th>
<th>Tangible Assets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capabilities</td>
<td>Competency map</td>
<td>Material supply</td>
<td>Physical assets</td>
</tr>
<tr>
<td>Leadership</td>
<td>Distinctive Competences</td>
<td>Licences, quotas and franchises</td>
<td>PP&amp;E</td>
</tr>
<tr>
<td>Workforce calibre</td>
<td>Routine Competences</td>
<td>Registerable IPR</td>
<td>Inventory</td>
</tr>
<tr>
<td>Organisational</td>
<td></td>
<td>Copyright</td>
<td>Other</td>
</tr>
<tr>
<td>Market</td>
<td></td>
<td>Protected originals</td>
<td>Financial</td>
</tr>
<tr>
<td>Innovation/R&amp;D</td>
<td></td>
<td>Trade marks</td>
<td>assets</td>
</tr>
<tr>
<td>Corporate renewal</td>
<td></td>
<td>Designs</td>
<td>Cash plus</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Securities</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Investments</td>
</tr>
</tbody>
</table>
The right-hand side of the diagram highlights the tangible and legalistic assets of an organisation. These are the more tangible assets typically shown on a balance sheet and are valued and appraised accordingly.

It is important to understand the distinction between product and services. A useful definition is:

_A service is any activity or benefit that one party can offer to another that is essentially intangible and does not result in the ownership of anything. Its production may or may not be tied to a physical product._ (Kotler and Andreasen, 1995)

It is worth pointing out the use of the words like “essentially” and “may or may not” in the definition. A convergence in thinking which recognises that physical products possess intangible benefits, such as a television which has free after-sales service or credit terms on purchase, while intangible services may require physical input in their creation and consumption.

In services organisations it is harder to delineate the value chain model than in manufacturing organisations. This is because services vary in several important factors (Pitta and Laric, 2004). Firstly, within a services organisation the product is less commoditised and each offering can be tailored to the customer needs. For instance, in the development of a new website a company may hire a design agency, and although the design agency will undoubtedly have tools and models that they have used before in order to facilitate the process, the final deliverable, i.e. the website design, must be unique and individual for the customer to give them best value for their investment (Baker, 1991).

Secondly, the participation by the customer (as opposed to the consumer) in the process can be high (Kotler and Andreasen, 1995). In the above example the involvement by the customer is paramount from first conceptual ideas, the first draft design layouts through to final release of the site. It is unlikely that a company would be happy with not being involved to some extent at every stage of the process. Certainly, in the more consultancy-based work the interaction with the customer is part of the overall deliverable in terms of ways of working and knowledge transfer.
Thirdly, there can be uncertainty concerning the absolute process to be followed. As mentioned earlier a lot of service-oriented companies will have developed models on which to base their “products”. This is to allow them to reuse learning from previous engagements and also to demonstrate to the customer that they are not starting from scratch. However, this is really only a starting point on which to base further work in order to deliver a tailored product. In a manufacturing world the statistics and metrics are more formulaic and therefore easier to implement in measure. In the services world this is not the case, for instance there is still no quantifiable method of measuring programmer output. People have measured lines of code and use Function Point Analysis, but these are still subjective in nature and offer no guarantee of consistency of a measurement process.

Pitta and Laric (2004) summarised this as “the metrics are less precise and, consequently, the service value chain can be more complex. In fact, the value chain is comprised of several possible value chains, thereby forming a network of relationships, rather than the sequence customarily associated with the value chain”.

One area that is inherent in the value chain, especially in the service industry context, is the concept of relationship marketing. This is important in the longer-term partnerships which most companies would like to engender with all key components in the value chain or network. The idea of total relationship marketing (TRM) put forward by Gummesson as cited by Pitta et al. (2004a) is that it underscores mutual benefit, win-win relationships with customers and other partners. He goes on to say that the “core values of relationship marketing are found in its emphasis on collaboration and the creation of mutual value”. The idea being that all participants participate in the value chain as a “plus-sum” game where the parties increase value for each other as opposed to the often quoted “zero-sum” game where one party wins at the expense of others in the chain. This plus-sum focus will also affect the values of each of the companies or organisations involved and these values must enhance the relationship, product or service instead of those who preserve the bureaucracy. This is similar in principle to the Prahalad and Ramaswarmy (2004) notion of co-creators of value as mentioned in the previous section. Companies will fend off threats to their existence by elaborating rules, reacting rigidly and predictably, and focusing on internal routines rather than results (Pitta et al., 2004). However, the term “relationship marketing” has come to cover a disparate range of activities and has been described as a set of marketing tactics through to a whole philosophy which cuts to the core of the marketing concept through its customer lifetime focus.
The idea of relationships between organisations is very relevant to the investigation and the initial studies focused on industrial buyers on the supplier of industrial goods (Campbell, 1985), transactions between parties at the same level of the supply chain (Bucklin and Sengupta, 1993), and relationships between government bodies and private sector organisations (Waddock, 1989). It is this last area that is most interesting to this research. There is growing interest in the idea of a “seamless” organisation (also sometimes called a virtual organisation) in which external relationships become operationally indistinguishable from internal relationships (Palmer, 1996). Also, in the area of distribution channel chains and other inter-firm cooperative arrangements, managers are in need of a better understanding of the special challenges of operating such interconnected systems (Rokkan and Haugland, 2002). The research by Palmer cites that there is a relative absence of literature which integrates inter-organisational relationship development with intra-organisational relationship development. The findings of his work show that external relationships should not be viewed in isolation and that the more successful local government activities occurred when relationships had developed in both directions.

In summary Pitta et al. (2004) say that the TRM contribution to the value chain is threefold. Firstly, the long-term relationship is a critical perspective if a value and supply chain is to succeed in delivering value. Secondly, it recognises that the relationship can develop and that its interactions can improve the value delivered. Thirdly, it acknowledges the influences of stakeholders and parties not directly connected with the value chain.

The value chain has been used extensively for analysis of the networks in the service area, as identified by people such as Pitta and Laric (2004). This helps to establish the tool as appropriate for use within an environment where there are a considerable number of independent organisations.

4.2.4. Value Chain and Network Summary

The use of the value chain model is not new in research and there are many papers that use this as a basis for analysis. The strengths of the model are that it allows an organisation to be mapped in a more graphical fashion where the interrelationships are clearer than a pure descriptive text. This can then be extended to other organisations and the linkages between them. Later on in the chapter this concept of the extended model is used to show the possible connects between companies in a distributed environment in a manner that is synonymous.
with the value network. This concept is extended further in the work by Pitta and Laric (2004), who modelled aspects of the US health service on to the value network in a diagrammatically different way (Figure 7). As they point out, a lot of the connections are neither linear nor sequential and could be iterative and circular; however, as a diagrammatic method of showing a large number of organisations it works very well as it also demonstrates the concept of the grouping of organisations and to a lesser extent the scale-free aspect of hubs.

Having established the credibility of the Porter model, the next stage is to apply it to service organisations. In his original book Porter (1985) did reference the service aspects of the value chain, but the primary focus is that of producing and moving goods around. The issues of the differences of the service value chain are discussed further as this is the model that is most appropriate for British Tennis. The ultimate consumer is a tennis player and the service provision is the courts, infrastructure, coaching etc. This area of the service industry brings in the aspect of the relationship marketing which is important as it identifies and segments the market building on the appropriate segmentation.

4.3. **Value Chain and ERP Integration**

In Chapter Three the ERP modules were established and now the two key subject areas of ERP systems and the value chain need to be integrated. Figure 10 shows the updated value chain showing the ERP modules. This is the basic value chain outline as identified by Porter (1985) and then overlaid with the ERP modules as identified earlier. The modules in red are the areas identified as the common modules for the purposes of this research. The list established previously is as follows:

- i) Sales and marketing (including membership/customer registration)
- ii) E-business
- iii) Financial
- iv) Additional specialised modules to be integrated (new modules)
ERP systems, as described above, did not just appear one day in a fully functional format. They are developed over time and are still developing as vendors strive to create competitive advantage. This evolution is important to understand as it puts the ERP system growth into context and demonstrates how it has been used in existing areas and how it can, potentially, extend further into new areas.

In the commercial world the use of large integrated systems using ERP-based databases or with home-grown applications has been growing year on year as more and more organisations realise the benefits that are both tangible and intangible (Shang and Seddon, 2002b). The growth of hardware and software capability has also enabled organisations to store large amounts of data which would not have been possible a number of years ago. As an example an ex-executive of Tesco Stores said “The Clubcard data that is stored by Tesco Stores Ltd on a daily basis contains information of every purchase and can match that with your Clubcard number and hence your address. This can, therefore, give an estimate of living and lifecycle stage. This is now everyday processing for them and the data volumes don’t seem as daunting as they did several years ago”

Systems such as those mentioned now have far-reaching availability and the use and growth of the internet have facilitated this increased usage. The phenomenon that is eBay
demonstrates the extent of the capabilities of systems both to support thousands of users at any one time, and to store many millions of item descriptions.

The growth of broadband has been key to the success of some of these ventures, and is now in 60% of all UK homes, giving a major level of internet capability to more people at different life stages. The acceptance level and trust level of the internet users has also increased over the years (Dutton et al., 2005).

The structure of the ERP systems in this chapter gives the framework of the capabilities and advantages (and hazards) of such systems. This shows what the systems functionality is, what the system benefits are likely to be and what the likely costs are going to be. The overview of the use of the value chain as a model which can be overlaid on the value chain and network frameworks to give a tool for the analysis of the linkages and interactions involved in the network – in this case the community of British Tennis organisations.

The use of systems has been investigated and applied to many industries such as manufacturing (Raymond and Uwizeyemungu, 2007), health care (Stefanou and Revanoglou, 2006) and, more diversely, fashion (Bertolini et al., 2004). But that same level of investigation and research into the use of systems by sports organisations for the improvement of the quantity and quality of people playing the game seems to be lacking. Peripheral elements to the sport, such as the retail outlets, have huge systems to support the selling and merchandising of sports equipment but within the game itself the level of research on the use of existing integrated systems is low, or possibly non-existent.

Technology, therefore, has progressed in the field of large-scale integrated systems and the hardware and infrastructure required to run the systems, and the extensive use of PCs and broadband in the home market means that a fresh approach can be taken to delivering systems that have a large-scale public user base in order to improve the information and functions available to the club, the LTA and the government organisations.

4.4. Summary

The first section discussed the organisational structure of the sport and specifically highlighted the role of the LTA as the National Governing Body of the sport. This role includes strategic and operational responsibilities but also highlights the issue that it does not have complete
control of all resources and additionally that it does not have complete control of the decision making process. Additionally there are a number of not-for-profit organisations involved, where the level of volunteers is an important issue, as highlighted by Slack (1997, p109).

The next section discussed the history and concepts behind ERP systems design and also identified benefits in the areas of operations, strategy, management, infrastructure and organisation. The positive benefits of implementing on the revenue and profitability on the financial performance of an organisation were also shown by Hitt et al. (2002), as well as the benefits of an extended virtual network, as shown by Jaisal et al. (2005). The concept of an extended virtual enterprise was also introduced which will be discussed as part of the ERP framework to allow the extended number of organisations identified to be able to communicate further. Critical success factors are an important aspect of systems implementations and two frameworks were compared to highlight areas of commonality for CSFs for ERP systems. These included items such as senior management commitment and costs.

The last section discussed the value chain in order to bring together the organisational and technology components into a framework. The value chain is concerned with the internal functions and linkages within an organisation and the value network itself looks at the external linkages. This was then mapped on to an ERP framework. The area of extended virtual networks was also raised which is applicable to the extended network of organisations involved in Tennis. The Pitta and Laric (2004) model gave a graphical representation of the linkages and this will be used later on in the thesis to demonstrate the linkages of the network under review.

Having established that ERP systems have considerable benefits to organisations but are not without complexity and cost in terms of both time and cost, the next section discusses the research methodology and approach appropriate to the research questions identified and the issues raised in the literature review.
Chapter Five: Research Methodology

5.1. Introduction

The previous chapters established the research questions and the use of the value chain and ERP systems within British Tennis. In order to further the research it is necessary to develop an appropriate research design and then appropriate methods to support that design. The research design will firstly ensure that the study will be relevant to the problem and, secondly, that the design of the investigation will employ economical procedures (Churchill, 1979, pp46-47).

The research framework is a qualitative research process which uses Bryman’s research process (2001) at the core. Using this framework establishes the research questions in the first phase, going on to select relevant sites and subjects and the commensurate collection of relevant data. This collection of data is followed by the interpretation phase, conceptual and theoretical work, and this then iterates for further data collection which will provide further insights in to the data and also confirmatory findings which corroborate previous data.

The research takes a case study approach although the second iteration has aspects of a survey as the number of new issues raised are reduced. The data collection was done via in-depth and semi-structured interviews and via documentation available. This was then processed using content analysis via open coding and axial coding to establish the themes and issues within the data. Lastly, this was reviewed using three external reviewers to validate the coding hierarchy.

DBA Philosophy

In view of the more applied nature of the Doctorate of Business Administration it is appropriate to note the possible distinction between social science research and management research. Easterby-Smith et al. (2002) highlight three elements which they consider differentiate management research from the social sciences research. Firstly, they consider that, despite the progress toward creating distinct disciplines within management, it is still a largely eclectic practice. Managers draw on knowledge and experience from multiple areas such as technical, cultural and functional boundaries, plus they draw on knowledge from other disciplines such as economics, statistics and maths. Secondly, Easterby-Smith et al. (2002) point out that managers do not have the time to allow researchers to have carte blanche access
to their organisations unless there is some tangible payback, which in many cases will not be
the case. The issue of confidentiality and publication can also be raised as issues, although the
academic community have methods to ensure this is catered for. This perspective is covered in
the next chapter. Lastly the third element, Easterby-Smith et al. (2002) raise the issue that
management requires thought and action. This is congruent with the applied nature of the
research and is covered by Research Question Three, which proposes a framework system that
practitioners would be able to take and build on in a applied manner whilst maintaining the
academic framework and research behind it.

5.2. Research Questions

1) What are the objectives of the organisations identified in the provision of British
Tennis and what are the linkages between them?

As established in Chapter Two, the picture of the organisations involved is a complex
area involving four principle groups of organisations (nationals–government, nationals–non-
government, regional and local) and then many organisations within each group. Using the
value chain the research needs to establish the level of interaction between the various groups
into order to map out a high-level network and the type of information flow there is between
the groups. Due to the differences in the objectives, government versus non-government,
private organisations etc, there is no standard quantitative method that would allow for the
variations to be covered in a method that would be applicable to all but that is practical to use.
This means that the research method is more applicable to a qualitative approach which allows
for the variety and richness of data to be explored and the level of understanding to be
established. The next sections discuss the use of case study research and interviews as part of
the data gathering process. This area of interaction has not been researched before and,
therefore, there is no previous data to be called upon which would allow assumptions to be
made early on in the research.

2) What are the principal software systems currently in use by the organisations and
how effectively are they used in terms of system and information quality?

A similar picture emerges for the data gathering for Research Question Two as for
question one. The same disparate organisations use a variety of software to meet their business
and technology needs. The data to be collected is intended to allow us to understand what
software is being used within the organisation; whether it is already using an ERP system,
modules within an ERP system, niche or standalone software; or whether manual or basic
spreadsheets or word processors are being used. Although similar software may be in use by similar organisations it may be being used in different ways to meet the organisation’s needs.

In this research area there are a huge number of options which would be extremely difficult to try and cover in any depth via a quantitative method. Therefore the qualitative approach is also appropriate to progress the data for this research. As this is closely related to Research Question One, the data can be collected at the same time via the same method.

3) To what extent can an ERP system be implemented in a public and private multi-organisational model?

This research question brings together the data from the literary research and the data collection from the previous two research questions in order to explore the proposal that an ERP framework could be used to meet and improve the objectives of the organisations involved at a number of levels. The issues identified by the research are discussed as part of the proposal which identifies the network, components, modules and examples of a data schema.

5.3. Research Method

The chosen method is via case study as it gives the opportunity to understand the subject under review in a holistic and synergistic manner, whilst remaining focused on the research questions.

Using the constructionist or phenomenological approach does not necessarily imply a qualitative approach to data collection. Janckowicz (2000) does make the case for the constructionist epistemology using authors who advocate qualitative rather than quantitative methods.

The use of qualitative techniques has been used before in the investigation into the use of various aspects of IT systems. This includes the issues of data quality (Xu et al., 2002), BPR and ERP systems investigations (Ho et al., 2004, Huq and Martin, 2006), the investigation into CRM organisational experiences (Light, 2004) and the measurement of performance in small firms (Jarvis et al., 2000). Being able to examine the data from a macro level of a case study using interview and documentation review also allows for triangulation and helps to strengthen internal validity (Light et al., 2001).
This idea of a research continuum is shown in Figure 11 as defined by Johnson et al. (2007). Rather than describing a piece of research as purely qualitative, or purely quantitative, or even as purely mixed methods, which they show as equally between the two, they have put forward the concept of a *qualitative dominant* mixed methods approach. This allows for the predominant method to be quality-based but allows for the addition of quantitative data to be included where necessary and appropriate. This is the approach that this research will follow. This is to ensure that there is a richness of data, allowed by qualitative methods, in conjunction with quantitative information, where necessary, to ensure a quality piece of research. This use of mixed methods is becoming increasing articulate and well defined (Johnson et al., 2007) and can be found in use in many different fields (Smart and Dudas, 2007), and the concept of qualitative dominant research has also been used to good effect (Holdom, 2006).

![Figure 11: Mixed Methods Research Paradigms (Johnson et al., 2007)](image)

The process that was adopted for this research is to use the research methods as proposed by Bryman (2001). This is used to give a framework to the research as shown in Figure 12 below.
1. General Research Questions

2. Selecting relevant sites and subjects.

3. Collection of relevant data

4. Interpretation of data

5. Conceptual and theoretical work

5b. Collection of further data

5a. Tighter specification of research questions.

6. Findings and conclusions

Process 1: This is the process whereby the initial research questions are formulated. These were highlighted in Chapter Two and reiterated earlier in this chapter.

Process 2: The next stage is then to select the relevant people and organisations for interview and/or case study. This is reviewed later in the chapter in section 5.5 on page 83 concerning the selection of data collection organisations.

Process 3: The method of data collection is then covered in the area. This is covered in section 5.6 on page 85.

Process 4: This area concerns the first pass of the data using the coding methods as discussed in Process 3. In this research the data collection for the first iteration used an in-
depth interview technique. This was to understand better the use of systems within organisations and to understand the interrelationships of the various organisations.

**Process 5:** In this area the data is analysed and positioned against the theoretical framework, as established in Chapters Three and Four. For the purposes of this research the data is categorised and analysed as per the open and axial coding taxonomy.

**Process 5a and 5b:** This is the iterative section of the process. As data is collected and insights are gained either pre- or post-coding, this may affect or create areas where further questions can be asked of other organisations, or it may act as confirmatory for data already collected. In this research the first iteration consists of in-depth and semi-structured interviews, plus documentation where available. The second iteration consists of semi-structured confirmatory interviews and in-depth where the semi-structured process is too restrictive to cover specialist or expert areas. An example of an expert or specialist area is Nottingham County council who are responsible for one of the country’s major tournaments and therefore have requirements that are different from those of other organisations. In practice the interview structure at the high level did not change between Iterations One and Two, but the probe questions were able to gain more insight into areas that were new information or issues. As an example it became clear during the research that a number of councils did not charge for court usage and they were just open to all. The method of charging for courts was included as a probe question as this is relevant to how an online module of an ERP might be used.

**Process 6:** This is the conclusion of the thesis and includes an in-depth analysis of the proposed framework, including the modules that are part of a ‘standard’ ERP system, and which modules would need to be part of a specific customisation. This would allow for the sport to accommodate the industry-specific requirements that are not covered by industrial sectors that are not involved in sport; e.g. ratings and rankings are an area which is tennis-specific due to its unique measurement methods.

For the purposes of this research the first iteration follows a mixture of in-depth and semi-structured interviews in order to understand and provide a focus and a boundary to the research. The second iteration provides more data to confirm the information in Iteration One. Where insights into the data in Iteration One have been found in addition to the subject areas discussed in the review of the literature then these areas can also be explored in more detail as
part of the second iteration. The three areas that were highlighted as part of Iteration One that were relevant to the research are strategy versus operations, power and politics in sport, and mandated versus voluntary systems.

In summary, using this process as a guide for the research methods allows the early part of the research to use the in-depth interviewing and documentation to gain insight into the research questions as there is no existing research into this area. The second iteration allows for two aspects: one is to perform confirmatory interviews where no new real insight is gained but it confirms data already collected, and the second aspect is where specialist areas are available.

### 5.3.1. The Case Study Approach

The use of a case study approach as a method of research is a common tool and has been used in many disciplines such as agriculture (Wilde, 1993), management development (Bom and Mollerman, 1996), technology (Duffield, 1997). As importantly, the case study method has been used in investigations into various aspects of ERP systems implementations with such diverse elements as ERP integration issues (Alshawi et al., 2004), cultural issues (Boersma and Kingma, 2005), or post-implementation effectiveness (Yu, 2005).

What the case study method allows is the “investigators to retain the holistic and meaningful characteristics of real-life events such as individual life cycles, organisational and managerial processes, neighbourhood change, international relations, and the maturation of industries” (Yin, 2003, p2).

Yin goes on to provide a technical definition as an empirical inquiry that:

- Investigates a contemporary phenomenon with its real-life context, especially when
- The boundaries between phenomenon and context are not clearly evident.

The investigation of a specific company or companies provides an insight into an issue or to redraw a generalisation (Stake, 2000). This Stake refers to as an *instrumental case study*, in that the case is of secondary interest and it facilitates our understanding of something else. In this instance the subject under investigation is the value chain in use between the various organisations in British Tennis and this, therefore, determines the unit of analysis. Although Stake does say that the three definitions of case studies he refers to (intrinsic, instrumental and collective) are not deterministic but are heuristic in nature, and therefore such reports and
authors do not neatly fit into such categories. The use of collective case studies is also important and he makes the point that they may be similar or dissimilar. The important aspect of similar or dissimilar case studies is to understand the differences and to be able to explain why they do or do not occur.

5.3.2. Advantages of the Case Study Approach

The case study approach is a strong method that has considerable advantages which can be, and has been, applied to IT systems implementation in many guises as mentioned previously. These can be summarised as follows:

The temporal aspects of the case can be investigated and therefore a sense of history can be developed (Jones, 2000). Decisions are rarely taken in isolation, but could be described as moments of truth (Buttle, 1996) and these are important to be captured in context as opposed to in isolation. In this particular context the change in government policy and funding has had a major impact on the organisation and structure of the various bodies involved, and this context needs to be understood in order to understand the current position.

The technique has been used successfully in other studies, some of which have been mentioned previously. In an investigation into ERP systems in engineering consultancies (Voordijk et al., 2005), the technique was used as it offered a way of gaining insights into the specific element of ERP under investigation. The case study methodology also allows a number of techniques to be used to triangulate and validate the data collected (Alshawi et al., 2004) as demonstrated in the next section.

5.4. Replication and Purposive Sampling

“Your choices, who you chose and why, all place limits on the conclusions that you draw” (Miles and Huberman, 1994). The sampling needs to reflect the value chain and network aspects of the research. Using this classification, it is important to get the representative views from the organisations within each group, but it does not have to be representative of the Great Britain population in terms of age or demographics.

With qualitative research it is more common to work with smaller numbers of samples rather than the quantitative methods of research which are aiming for larger numbers and context-striped cases and seek statistical significance (Miles and Huberman, 1994). The
method chosen for this qualitative research is purposive sampling coupled with the use of replication logic. Yin (2003) references the use of replication logic for multiple case studies. This is similar in concept to multiple experiments where the researcher is seeking to replicate the results for similar outcomes, or with contrasting results for predictable reasons. Within the tennis club environment one of the key variables is the number of courts. This effectively determines the capacity of the club and therefore, the number of members. Extrapolating this further, the number of members is likely to have an effect on the facilities and infrastructure of the clubs. There is also a large number of other variables that can have an effect on the use of systems, and part of the investigation will be to investigate what these variables are, and how they interact, and the effect they have on a proposed framework. It was important to ensure, from a club perspective, that a range of clubs was sampled, from clubs with three courts through to clubs with twelve courts or higher.

The common use of purposive sampling (Miles and Huberman, 1994) is partly explained because social processes tend to have a logic and a coherence, whereas truly random sampling can be reduced to “uninterpretable sawdust”. These social processes can be beneficial in as much as they can lead from one interview to another, but they do need to be checked as it could be that the researcher does not “break out” of that social hub. This topology can also be seen in the description of Game Theory and social network constructs as described earlier. Importantly, with a small number of cases random sampling can unintentionally create a decidedly biased view of the subject area. Within this research it is important to ensure that each of the four groups as identified in the previous section is sampled, either by primary data or at the very least, where access may be an issue, by secondary data.

The use of the Bryman iterative method also allows for data to be confirmed in part of the second stage of the method. Effectively this means that two rounds of purposive sampling were completed and the results compared to ensure that they were consistent. The second round used fewer in-depth interviews (except where very specialist areas were covered, e.g. Nottingham tournaments) and more semi-structured which became quicker and more focused as they revealed fewer new insights and value chain linkages and less data and systems usage.

For this specific research, the organisations sampled are as shown in Table 7. A mixture of techniques was involved to collect data and these are detailed below.
Data Saturation

As with many qualitative research projects, the criteria for closing the sample size is based on data saturation (Ojiako et al., 2008) which is defined as the point where no new insights from interviewees are being obtained. In this instance it was important to use the interview for the collection of the qualitative data in order to understand the different applications and how they were being used in each organisation. The sample size ensured that the different organisation headings were represented (as in Table 7) and that different sizes of organisations were represented for the headings where there was a larger set, e.g. councils and clubs. Iteration Two gave extended coverage across the various organisations. Data saturation is evidenced by the fact that Iteration Two yielded little more evidence. This is shown by the discussion of results in Chapter Six in Research Questions One and Two and Iteration Two for both questions. Additionally, in the section on Systems on page 159 three areas of system usage are identified. Using this data from Iteration Two of interviewees and written responses there were no additions or amendments made to these categories.

5.5. The Selection of Data Collection Organisations

The Game Plan (National Strategy Unit, 2002) identified the top level bodies involved in sport across Britain. This was not tennis specific and so this model was modified to highlight the organisations that are involved in British Tennis. This is shown again, for information, in Table 5.

<table>
<thead>
<tr>
<th>National (Government)</th>
<th>Nationals (Non-Government)</th>
</tr>
</thead>
<tbody>
<tr>
<td>o DCMS</td>
<td>o UK sport</td>
</tr>
<tr>
<td></td>
<td>o Sport England</td>
</tr>
<tr>
<td></td>
<td>o Lawn Tennis Association.</td>
</tr>
<tr>
<td></td>
<td>o English Institute of Sport</td>
</tr>
<tr>
<td></td>
<td>o ISRM, CCPR</td>
</tr>
<tr>
<td>Regional</td>
<td>Local</td>
</tr>
<tr>
<td>o Regional LTA</td>
<td>o Local authorities</td>
</tr>
<tr>
<td>o Regional sports boards</td>
<td>o Local sports councils</td>
</tr>
<tr>
<td></td>
<td>o Local sports clubs and associations</td>
</tr>
<tr>
<td></td>
<td>o Private health and fitness clubs</td>
</tr>
<tr>
<td></td>
<td>o Further and higher education Institutions</td>
</tr>
</tbody>
</table>
The table forms the basis of the selection of organisations identified for further analysis and is discussed in greater detail later in this chapter.

As the research progresses there may be other organisations which are less obvious in their involvement, but may still play an important part in the value network of British Tennis. These will be added to the list as deemed appropriate during the investigation.

For the larger groups of organisations (private clubs and councils) the method of selection was via quota sampling. For the councils this involved writing to 580 councils in Britain as listed in the ‘A to Z of Local Councils’ on the government website (www.direct.gov.uk). Unfortunately, there is no single interface or method of contacting all the councils and in order to contact them this involved following the links from the government A to Z listing and finding the appropriate link. The method of contact was as prescribed on the council’s specific website and varied between being provided with an email address to send an email to or to filling in “contact me” HTML entry screens. The approach also ensured that the councils who have an outsourcing arrangement within their district were included. Examples of this include Welwyn and Hatfield district leisure, whose services are operated by Finesse Leisure, and Charitable trusts such as GLL, which runs Greenwich leisure facilities as well as in a number of other boroughs. For the councils it was important to ensure a mix of council-owned and council-run leisure facilities as well as leisure facilities that were subcontracted, completely outsourced, or outsourced to a wholly owned charitable trust.

For the purpose of contacting the clubs a method of purposive sampling was adopted. The objective was to benefit from the experience and knowledge of the respondents which are highly relevant to the research questions. Although the LTA provide a central directory it was found to be significantly incomplete and the contact data included was very out of date and not correct. For the purposes of this research the method of purposive sampling used was “snowball sampling”, so called because the respondents who provide insight and primary data increase like a snowball as layers are added. In order to start the snowball rolling three regional LTA organisations were contacted and they were able to provide contacts of clubs within their region.
5.6. Research Techniques

This section looks in more depth at the use of the data collection techniques of documentation and interviews.

5.6.1. Documentation

The use of documentation is one of Yin’s (2003) six sources of evidence and is likely to be relevant to every case study topic. This can take many forms and is likely increasingly to consist of so-called soft copy or electronic files. The types of documentation that are likely to be available would include project documentation\(^4\), presentations including PowerPoint slides, emails, etc. They can broadly be categorised into internal secondary data and externally published secondary data.

Whether documentation is in soft or hard copy it does have a number of advantages and disadvantages as listed in Table 6: Advantages and Disadvantages of the use of Documentation (Yin, 2003).

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stable – can be reviewed repeatedly</td>
<td>Retriviaiability – can be low</td>
</tr>
<tr>
<td>Unobtrusive – not created as a result of the case study</td>
<td>Biased selectivity – if collection is incomplete.</td>
</tr>
<tr>
<td>Exact – contains exact names, references, and details of an event.</td>
<td>Reporting bias – reflects (unknown) bias of author</td>
</tr>
<tr>
<td>Broad coverage – long span of time, many events and many settings.</td>
<td>Access – may be deliberately blocked</td>
</tr>
</tbody>
</table>

Table 6: Advantages and Disadvantages of the use of Documentation (Yin, 2003)

The use of documentation is important, although cannot be taken at face value as illustrated in Table 6. It can be used as corroboration for other sources of evidence and for

---

\(^4\) If they are using a standard project methodology such as PRINCE2 then certain documents are extremely likely to exist, for instance project initiation, business case, risk and issues, checkpoint and board meeting minutes.
increasing reliability, establishing authentication and dependability, and increasing construct validity including triangulation (Reige, 2003).

The advantages of secondary data are also expanded by Churchill and Iacobucci (2002) who make the point that one of the main advantages is that of time and cost. The ability of the single or small team researcher to perform large-scale surveys is limited but a lot of data is collected and made available by government agencies, and whilst it may not be an exact match for the research, it is likely to provide high-level estimates or analysis.

In the case of the government departments and organisations such as the LTA, there is a wealth of information available as a matter of public record, either via their website or as links to documents on their website. Additionally, there are further sources of secondary data published by the government which contain information such as sports participation levels in the UK.

For the purposes of this research, there is no single piece of documentation available from all sources. Instead, there are very valuable items that have been provided as documentary evidence. These include such items as:

i) the full report of the LTA Tennis Grassroots review. This was an extensive review lasting approximately a year which investigated the whole aspect of community tennis, providing valuable corroboration with interviews and other qualitative and quantitative evidence.

ii) surveys on internet usage (Dutton et al., 2005)

iii) a documented case study of the growth of a London tennis club

iv) access to the clients and prospects of a sports development company specialising in support for tennis clubs.

5.6.2. Interviews

Themes within the Interview

As per the research questions of the thesis concerning systems and the interrelationships, there are a number of areas that need to be explored within an interview environment in line with the semi-structured format. In order to gain information, not just about the systems that they use but also about the information flow between organisations, there are questions that will give evidence of the nature of the inter-organisation interactions. These will then be used to help build up a picture of the organisational data flow. It will be
used in the analysis phase in order to identify existing data flows and also to identify any gaps which would create opportunities for an integrated data framework.

Principal themes are:

Introduction: Explain purpose of interview, headline objectives and ethical considerations (confidentially etc).

Interviewee’s role: A short description of the interviewee’s role and of their main responsibilities within their organisation.

Inter-organisation contacts: What are the other organisations that they have contact with? What is the nature of the contact and how effective is it?

Systems: Which systems do they use to help with their role? Prompt with suggestions after initial feedback.

Futures: Which contacts or systems would the interviewee like to see to improve either the number of people playing or the potential of the existing players?

Anything else: Give the interviewee the opportunity to give any other information that they feel hasn’t been covered anywhere else.

Thanks: Thank the interviewee for their time and give an indication of next steps.

The headings listed above that are specific to the research (inter-organisation contacts, systems and futures) have been created using the information from the chapters on ERP theory and practice and value chain and ERP systems, and are designed to achieve the following:

i) To understand the interrelationships with other organisations to populate a detailed value chain, it is necessary to understand which organisations the interviewee has interactions with. Not only does this enable a value chain and network to be developed but it also provides a vital validity component. If both parties agree on their interaction content independently of each other then this can then be judged to have validity. If they contradict each other then this will need to be investigated to understand the contradiction.

ii) To understand the current systems that are in use. A key aspect of the investigation is to understand the systems in use currently, the advantages and disadvantages of them and their efficacy.

iii) To gain information on the clubs. The size of the clubs involved is important as it gives a perspective on the administrative effort required to support the club. This in turn can give an assessment of the systems that are required to provide a professional service to the members.
In-depth Interviews

In order to understand the overall picture of the research a number of interviews were undertaken using an in-depth approach to the interview. This was to investigate the subject area in a less structured manner in order to probe and follow up areas that had not been identified by the literary investigation and also to probe the expert knowledge of the interviewee. The qualitative method of an in-depth interview gives the analytical strength in four areas – complexity, depth, context and dynamics (Milburn, 1995). This interview technique was used in the early stages of the investigation and was used with people who are industry or sport experts in their relevant fields in order to explore the subject area without the constraints of semi-structured interviews. These interviews attempt to understand the complex behaviour of the different groups (Fontana and Frey, 1994). Respondents in this area included the chair of a large British Tennis charitable organisation, chair of a regional LTA organisation, chair of a professional sports support organisation and MD of a sports software developer company. The interview follows the themes as set out above but allows the complexity of the subject area to be investigated in more depth. Although software systems can be purchased “off the shelf”, no two organisations are the same and therefore the way that the software is used will always be different.

Semi-Structured Interviews.

The semi-structured interview is widely used in flexible designs, either as the sole method or in combination with other methods (Robson, 2002). It is likely to include introductory comments; a list of topic and headings and possibly key questions to ask under these headings; a set of associated prompts and closing comments including thanks; and any follow-up opportunities. This gives the interviewer the freedom in sequencing of questions and in the amount of time and attention given to different topics.

The less structured elements of the interview, which gives it its increased flexibility, is the ability to identify areas which are not predetermined, which is achieved with the use of open questions. Gillham (2005) goes on to advocate a three-stage approach to the semi-structured interview: the preparation phase or developing the interview focus, the piloting phase, and the interview itself.

Although the semi-structured interview was the same for all groups, the probe questions differentiate each sector. The interview uses a mixture of open and closed questions.
The closed questions are used principally with the questions concerning lists, specifically the system in use and the organisations interfaced with. Where there is a positive response then follow-up or probe questions are asked, and where there is a negative response then the interview can move on, which reduces the burden on the interviewer and interviewee. Full transcripts of two interviews (one club respondent and one council respondent) are listed in Appendix C: Sample Interview. These are colour-coded to highlight core questions and probes, plus the statements used in the coding analysis are highlighted in italics.

The semi-structured interview for clubs is shown as an example.

**Semi-Structured Interview Detail**

Introduction to project. *This covers the purpose of the research and some background of the interviewer in order to establish expert credibility in the subject area.*

Confirmation of confidentiality.

Permission to record.

1) Can you describe your role and organisation?

*Additional probe questions would be included depending on how comprehensive their response, e.g. How many courts? How many of these are floodlit? How many members? Clubs: is this a private or limited liability company? For councils: do they have wholly owned or trust status? For councils: what is the method of management? For Councils: do you know who plays on them?*

2) What systems do you use currently? *Probes for all the items in this section would include whether the systems were online or not, if they are a package, and who the supplier is. How effective the respondent felt the system was; what sort of issues the system used presented.*

1) E-business
   i) Membership systems
   ii) Online booking
   iii) Website
2) Sales and Marketing
   i) Including online sales
   ii) EPOS
3) Financial
4) Other modules to be integrated. For the specialised nature of the research this will include coaching aids and tournament specialist software.

3) Do you have interaction with other organisations? *If the response is yes then the follow-up questions would explore the nature of the interaction and what sort of data is exchanged. The initial closed question is deliberate in order to provoke a very positive or negative answer. It would be very unusual for an organisation to have interactions with all of the organisations listed and would therefore be not productive to phrase an open question as a start point. Additional follow up questions explore the usage of software that is used and systems quality or the effectiveness or efficacy of the system.*
   a) DCMS
   b) UK Sport
   c) Sport England
   d) LTA/ regional LTA
   e) Council facilities
   f) Private clubs
   g) Commercial clubs

4) Suggestions to improve English tennis quality and quantity over the next five years? *As this is a broad, open question then suggestions would be made for areas of improvement, such as tournaments, marketing and indoor tennis.*

5) Are you happy with the amount of competitive tennis played or would you like to see more or less?

Close. *Thank the respondent for their time and give contact information if they have any further information to provide.*

**Data Collection Methods and Responses**

Table 7 shows the expanded table with details of the data collection method used and the responses from the organisation and sector.

<table>
<thead>
<tr>
<th>Organisation</th>
<th>Research Technique</th>
<th>Why appropriate?</th>
</tr>
</thead>
<tbody>
<tr>
<td>National</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Government)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>DCMS</td>
<td>Written response to questions</td>
<td>The government department concerned would not allow an interview but they were happy to respond to specific questions</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Nationals (Non-Government)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>UK Sport</td>
<td>Written response to questions</td>
<td>Would not allow interview but were happy to respond to written submission</td>
</tr>
<tr>
<td>Sport England</td>
<td>Written response to questions</td>
<td>Would not allow interview but were happy to respond to written submission</td>
</tr>
<tr>
<td>English Institute of Sport</td>
<td>Secondary Documentation</td>
<td>Not a primary tennis provider</td>
</tr>
<tr>
<td>Lawn Tennis Association</td>
<td>Written response to questions, LTA consultant semi-structured interview Primary documentation via Community Report</td>
<td>The LTA would not interview but were happy to provide written responses to questions plus interviews with LTA consultant and software supplier to the LTA</td>
</tr>
<tr>
<td>ISRM, CCPR</td>
<td>In-depth interview and secondary documentation from CCPR</td>
<td>Allowed interviewee to cover many areas that their organisation covered</td>
</tr>
<tr>
<td>Regional LTA</td>
<td>In-depth interview with five large county organisations chairman or County Development officers.</td>
<td>Allowed interviewee to cover many areas that their organisation covered</td>
</tr>
<tr>
<td>Regional sports partnerships</td>
<td>Semi-structured interview with local sports partnership</td>
<td>Allowed interviewee to cover many areas that their organisation covered</td>
</tr>
<tr>
<td>Local authorities</td>
<td>Interview and written responses from 28 councils including joint private public initiatives</td>
<td>Allowed a mixture of in-depth, semi-structured and confirmatory interviews</td>
</tr>
<tr>
<td>Sports clubs and associations</td>
<td>16 semi-structured interviews</td>
<td>Allowed a mixture of in-depth, semi-structured and confirmatory interviews</td>
</tr>
<tr>
<td>Further and higher education institutions</td>
<td>Russell University Head of Sport and Sports coordinator. Secondary Documentation</td>
<td>Allowed a mixture of in-depth, semi-structured and confirmatory interviews</td>
</tr>
<tr>
<td>Schools</td>
<td>Sports Advisor for Education for an London Education Authority</td>
<td>Allowed interviewee to cover many areas that their organisation covered</td>
</tr>
</tbody>
</table>

| Other specialist areas | In-depth interviews with performance | Allowed interviewee to |
| Coaches |  |  |
Nationally ranked professional

IT director of major retailer

coaches at national and club level

In-depth interview

Allowed interviewee to cover many areas that their organisation covered

Allowed interviewee to discuss possible applications of industry proven techniques to the sports sector

Table 7: Organisational responses

The decision to use in-depth and semi-structured interviews is based upon the stage of the research and the number of interviewees in the group, plus the specialised knowledge of the interviewee. If the interviewee had specialist or niche knowledge then the more in-depth approach was used to ensure that a broad area of knowledge was covered. For a large group during the early stages a more in-depth approach was taken, and then for the second iteration this was replaced by a confirmatory approach and the interviews would typically take around 15 minutes. The full list of interviewees is available in Appendix A.

In all, information was gathered from 61 different organisations or individuals, of which the majority was via in-depth or semi-structured interviews. Additional information was also taken from secondary sources – government websites and written responses to questions where primary sources were not available or not willing to participate.
5.7. **Validity and Reliability**

The requirement to ensure validity is to be able to verify the evidence from a second and preferably a third source. This may take the form of seeking validation from multiple interviews or with interviews correlated with documentary or archive evidence which corroborate each other. A different approach to the discussion in multiple sources of evidence says that if a construct exists then it should be measurable (Churchill, 1979). The ability to measure it should use different methods to ensure that it is valid. Essentially, if all the methods are measuring the same construct, the correlation between the various methods should be high.

The area of reliability is concerned with repeating (not replicating) the same test and attaining the same results. In general terms this is where the researcher can rely on the data gathered (McKinnon, 1988). A subsequent researcher should find the same evidence and arrive at the same conclusions. The goal of this aspect is to minimise the number of errors or any bias that could appear in the findings. The important aspect of this test is to ensure that all methods are documented such that any subsequent researcher would be able to repeat the investigation. What was unique about this investigation was that the data could be validated by obtaining information from either end of the connections of the value chain, i.e. (National Strategy Unit, 2002)

In this instance, UK Sport have no interaction with private clubs due to funding policies with the Olympics and able-bodied sport, and private clubs for their part confirmed that they do not have any interaction with UK Sport. It is not necessary to validate this any further.

For the purposes of this investigation, the research has utilised three methods of reliability and validity. Firstly, the open coding headings have been independently verified by three independent experienced people, discussed in the next section. The results of this independent review are shown in the following section on content analysis coding results. Secondly, the open and axial coding techniques provide two different methods of looking at the same data to determine the value chain interrelationships. This allows for validity aspects to be highlighted in order to understand and corroborate both ends of the chain. Lastly, the independent report from the LTA provides an important source of secondary data as the research incorporated approximately 100 interviews which are summarised and reported. The report was specifically aimed at grassroots tennis and therefore incorporates subject areas specific to that group.
5.8. Analysis of Data – Content Analysis

As Straus and Corbin (1998) discuss in their book, the area of classification is one area that is highly open to interpretation and even the most simple of objects can be interpreted as having several uses. This means that the interpretation of data can be open to more than one meaning and it is how one defines and interprets those attributes that determines the various ways in which concepts are classified. In the review of the data the researcher will break down the data into discrete incidents, ideas and events that are then given a name that represents or stands for them (Strauss and Corbin, 1998). The name may be given by the researcher because of imagery or meaning or may be said by the interviewee themselves, which are also known as “in vivo” codes (Glaser and Strauss, 1967). Strauss and Corbin go on to say that categories are concepts which are derived from data that stand for phenomena. These phenomena are important analytic ideas that emerge from the data.

One aspect of the content analysis to highlight is the interaction between coding and the use of the value network as the framework for the theory analysis. As this is specifically looking at the interactions between organisations the content analysis needs to reflect this and prescribe categories that reflect these connections. This analysis of the data is central to the theme of the thesis as it is then used to understand the nature of the data and information interchange and to process interactions between organisations. In principle this method of analysis is analogous to the use of “axial” coding (Strauss and Corbin, 1998, Easterby-Smith et al., 2002), where the principle is the process of relating categories to their subcategories. It is termed axial because the coding is centred on the axis of a category – in this case the organisations identified within the value network. Specifically with axial coding, when working with actual data (Strauss and Corbin, 1998) the linkages between events and happenings can be subtle, and it helps to have a scheme that can be used to “sort out and organise the emerging connections”.

Open Coding

The abstract or “open” coding of the data, as described earlier, is also used to highlight themes raised over and above the value network linkages. The method of coding involved a two-stage process. Firstly, this involves identifying the substantive statements within the text. Secondly, having identified these statements, the next stage is to decide on the relative categories to be used for the ongoing analysis. This involved several iterations and review of the text in order to establish an organisation of the common meanings derived from different
accounts (Gillham, 2005). In order to further improve the validity of the process, three independent experts were used to review the categories identified, review a sample of transcripts, and add/amend the categorisation to date.

The independent reviewers consisted of three people: two researchers who had recently completed their Doctorates using a similar research methodology and therefore had recent and relevant experience; and a third independent expert, who is a IT practitioner. Although they were not familiar with the open coding techniques per se they were able to review the coding categories to agree or challenge the categories. The researchers were sent the transcripts without coding in the first instance, i.e. ‘blind’, and these were then discussed and a suggested set of categories agreed upon.

The sample interview transcripts for the researchers were selected from different quadrants of the Game Plan organisation listing (National Government, Nationals Non-Government, Regional and Local). This ensures a wide spread of organisation viewpoints and diverse content for categorisation, as opposed to multiple transcripts from the same genre, e.g. only clubs. The process of coding also ensured that the statements were mutually exclusive, that is to say that no statement was included in more than one category. The category listing and independent modifications are shown in section 5.9.

Where the coding referred to more than one subject area and if it were reduced down then the context would be lost, the item is therefore coded twice under the two headings.

The appendix contains two interviews, one with a private tennis club official and the second with a council official. They have been highlighted with colour coding to highlight the core questions, the probe questions, the coding statements and the relevant coding category.

**Axial Coding**

The use of axial coding will be used to populate the value chain network as described. Pitta and Laric (2004) used a model to graphically describe the linkages in the network. This model uses groupings in order to simplify and demonstrate the complexities of the interactions. This method of presenting the interrelationships is chosen as it allows a lot of information to be shown quickly and easily. The use of visual groupings may help to reduce the number of lines shown later, and is used to validate the LTA as the central hub on which to base the integrated framework proposal of Chapter Seven.
5.9. Open Coding External Review

The full details of the open coding are shown in Table 8 below. The process of coding followed the process as detailed earlier in this chapter. It is important to validate this process and therefore a sample of the interviews was made available to external reviewers.

5.9.1. Content Theme Analysis

Table 8 shows the frequency of themes following a process of codification as described above. An extract from the coding analysis is included as Appendix D.

It is important to note that the frequency of the theme does not necessarily reflect the importance of an issue, simply that there is consensus on the issue. It is entirely likely that a single respondent may raise an issue that the others were not in a position to know, and that this may have considerable relevance to the particular theme or research question.

It is also valuable to review previous interviews on an ongoing basis, as subjects raised in earlier interviews could be brought in to a better contextual light as a result of subsequent interviews or new data.

The following table (Table 8) shows the frequencies of the categories, as identified by the open coding method and categorised as per the input of the two independent researchers.

<table>
<thead>
<tr>
<th>Category</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clubs</td>
<td>68</td>
</tr>
<tr>
<td>Non-Club Tennis (Council and Commercial Provision)</td>
<td>14</td>
</tr>
<tr>
<td>Coaching</td>
<td>25</td>
</tr>
<tr>
<td>Competition</td>
<td>30</td>
</tr>
<tr>
<td>IT Systems</td>
<td>64</td>
</tr>
<tr>
<td>Organisations (Strategic and Organisational Linkages)</td>
<td>71</td>
</tr>
<tr>
<td>Websites</td>
<td>31</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>303</strong></td>
</tr>
</tbody>
</table>
5.10. Ethical Considerations

Ethical issues are important considerations to a researcher. Whilst it may not be necessary to develop a full code of ethics in the same way that professional organisations need to, e.g. British Psychological Society have a complete code of ethics and content downloadable from their website, it is important to be able to cover certain aspects of the research to all potential interviewees.

Perhaps one of the most important considerations is that of privacy, confidentiality and anonymity (Miles and Huberman, 1994). Whilst it is not the researcher’s intention to ask anyone to disclose organisational secrets it is possible that interviewees will inadvertently relate information that they believe is covered under a confidentiality agreement that would be highlighted at the beginning of the interview. However, the confidentiality agreement is primarily aimed at protecting the anonymity of the interviewee by keeping the organisation and role secret within the thesis. Even this may not be sufficient, as by interviewing the managing director of a specific organisation it would not be difficult to work out their position, given the specific nature of the organisation and the role. Where this may be possible the role and/or organisation will be generalised further so it is impossible to discern from the text.

Easterby-Smith et al. (2002, p75) take a different perspective on ethical consideration, as they are looking at some of the politics of management research. This considers the relationship between junior and senior managers and they link it to the responsibilities of more powerful people against those who are less powerful. This relationship is not a specific issue but the premise that there is a valid concern that some comments made by some interviewees may be less than discreet. Where this is applicable then the research will use discretion as appropriate.

Lastly, there is the issue of intellectual property rights. All ideas and proposals that are discussed in the progression of Research Question Three are the original ideas of the researcher and are the intellectual property of the researcher. Any ideas suggested or raised by respondents will be credited as part of the text.
5.11. Research Design Summary

As identified in the Game Plan (National Strategy Unit, 2002) shown on page 84 earlier in this section, there are a number of organisations involved in the delivery of tennis and the research design needs to reflect this diversity in order to obtain research data that passes the reliability and validity tests.

Churchill and Iacobucci (2002) make the point that there are no right or wrong ways to carry out research, but that some are more appropriate than others. With this research the very nature of ERP systems do not lend themselves to a positivist approach in the early stages, as the subject is a large area that covers many components, and there are a considerable number of organisations involved. As with the Buttery et al. (1991) approach, where the early stages of the project are less well defined, a constructionist approach is more appropriate. Certainly, in the later stages of a project the requirements need to be very precise for specification documents to be written (Pressman, 1996) and a much more methodical approach needs to be taken to ensure a successful project that delivers customer value.

The in-depth qualitative dominant analysis can only really be achieved effectively via unstructured and semi-structured interviews, using relationships and systems as the prime subjects and probing as necessary to understand further aspects and areas for investigation. Using the content analysis techniques of open and axial coding to highlight, correlate and validate the headings, allows the data to be analysed and presented in an academically robust manner.

Some aspects of the quantitative research may be used where it is available and appropriate, e.g. in the use of internet statistics, which may be important to provide triangulation with other data collection techniques and to improve the validity and reliability of the findings.

The research strategies, including methods and techniques that have been identified in this chapter and used for this thesis, are valid and reliable. This will ensure that the conclusions and recommendations of this research are robust and relevant and that the framework proposal is based on critical analysis.
Chapter Six: Analysis and Discussion

This chapter reviews the data collected and discusses the findings. It is structured based on Bryman’s research process model (2001). Firstly, Research Question One concerning the organisations and linkages is discussed and this is broken down into the results from Iteration One which is also subdivided into the review of the organisations’ goals and objectives. This is followed by additional theory and then the examination of the linkages between the various organisations. Iteration Two is then reviewed and the results of both sections plus the additional theory are discussed. Research question two is addressed using the same basic structure, i.e. Iteration One, theory, iteration and discussion.

6.1. Research Question One

Research Question One relates to the organisational structure surrounding British Tennis. Specifically: what are the objectives of the organisations identified in the provision of British Tennis and what are the linkages between them? The organisations range from Government departments through to small, privately own tennis clubs and each has different organisational targets and objectives. The breadth of organisational difference is also highlighted by public and private ownership, size of organisation, and volunteer elements.

6.1.1. Iteration One: Respondent Themes relating to Research Question One

The purpose of this section is to highlight the objectives of each organisation and to give an indication of the type of organisations within the category. For example, within the section on private clubs there is a discussion on LTA-affiliated clubs and non-affiliated clubs, as well as a description of the type of organisation. This section also helps to position the linkages between the various organisations for the following section.

6.1.2. Organisations’ Goals and Objectives

This section reviews the individual organisations in order to identify what they are, their purpose and their objectives. The aim of the section is to examine the goals and objectives of the various and varied organisations both in ownership, funding and goals. This section then leads on to the interactions between the organisations as identified in the value chain linkages in the next section.
The information given below is taken from secondary sources, ranging from websites, information from published documents, and information requested directly from the specific organisations.

**Department of Culture, Media and Sports (DCMS)**

**Organisation and Objectives**

The DCMS is the main government body responsible for sport in England. The aim of the organisation is “to improve the quality of life for all through cultural and sporting activities, support the pursuit of excellence, and champion the tourism, creative and leisure industries.” (Department of Culture Media and Sport, 2006).

The DCMS has two objectives (National Strategy Unit, 2002): firstly, a major increase in participation in sport and physical activity, primarily because of the significant health benefits and to reduce the growing costs of inactivity; and secondly, a sustainable improvement in success in international competition, particularly in the sports which matter most to the public, primarily because of the “feel-good” factor associated with winning.

The department has five specific objectives (Department of Culture Media and Sport, 2006) which are:

**Children and Young People**

Further enhance access to culture and sport for children and give them the opportunity to develop their talents to the full and enjoy the benefits of participation.

**Communities**

Increase and broaden the impact of culture and sport, to enrich individual lives, strengthen communities and improve the places where people live, now and for future generations.

**Economy**

Maximise the contribution that the tourism, creative and leisure industries can make to the economy.

**Delivery**

Modernise delivery by ensuring our sponsored bodies are efficient and work with others to meet the cultural and sporting needs of individuals and communities.

**Olympics**

Host an inspirational, safe and inclusive Olympic Games and Paralympic Games and leave a sustainable legacy for London and the UK.
Therefore, in summary the DCMS has an overarching responsibility for sport in Britain but no operational responsibilities, i.e. it does not manage sports and recreational facilities itself, but has a remit to ensure that facilities are available for the community.

**UK Sport**

*Organisations and Objectives*

Sport UK’s primary goal is sporting excellence. It is not about bringing participatory sport to the masses. It is very clear that its number one goal is world-class performance. It does not provide any sporting facilities directly and does not manage any sporting locations or sites. It works with other bodies to “maximise our expertise and resources” (Sport UK, 2006). These bodies include the Home Country Sports Councils (Sport England covered in the next section), Sport Institutes, the British Olympic Association, the British Paralympic Association, and the priority UK governing bodies of sport e.g. the LTA. Sport UK’s remit is also increasing and has been extended to include the English Institute of Sport, Talented Athlete Scholarship scheme and the World Class Performance Pathway funding.

To underline this fact their four yearly targets concern the Olympics and Paralympic games; the yearly targets are primarily based around athletes on the Olympic Pathway programme; and these yearly targets are for the top events for that sport in the year.

**Sport England**

*Organisations and Objectives*

While UK sport is concerned with the high performance and elite elements of the sport, the role of Sport England is about promoting sport on a wider scale to create opportunities for people to get involved in sport. Their business objectives are fourfold: firstly to increase participation in sport in order to improve the health of the nation; secondly, to retain people in sport and active recreation through an effective network of clubs, sports facilities, coaches, volunteers and competitive opportunities; thirdly, to achieve sporting success at every level; and lastly to ensure that the service provided by Sport England is cost-effective. Sport England is accountable to the strategic government bodies that provide funding, which is mainly provided by National Lottery funds.
The LTA is included in the list of approved or recognised National Governing Bodies. However, funding for the LTA is less than 2% of their annual spend, but that conversely equates to approximately 6.7% of the LTA revenue (Lawn Tennis Association, 2009). The important aspect is that the predominant role is of funding in line with its objectives and it has no operational remit within the sport.

**LTA**

*Organisation and Objectives*

The primary aim of the LTA is to promote and advance the interest of Tennis in Great Britain and to act as the National Governing Body (NGB) for the sport. Specifically, this includes the dissemination of funds as deemed to be in the best interests of the game, the joint association with the All England Club for the joint promotion and management of the championships which includes Wimbledon; management of the national teams; and promotion of the teaching and training of coaches, teachers, referees and umpires. In terms of their internal measures of success they have three specific goals. These are to increase the number of players in the top 100 in the world, the number of players who are on track aged between 13 and 21, and the number of juniors competing (Draper, 2007).

The LTA has a pivotal role in the provision of tennis within Great Britain. This is from the perspective of trying to achieve the primary strategic goals of the government bodies which are to recognise top players, to encourage more people to play tennis, and to improve the nation’s health. Respondent Six described the LTA tag line as “more players, better players”.

**Regional LTA**

*Organisation and Objectives*

The regional LTA branches are the county branches of the LTA and are affiliated to the Association. They are autonomous bodies and as such do not appear to have a common mission statement (or mission statement at all in many cases) but they do have articles of association of which the following is typical:

1. To advance the interests of the game and uphold the rules and regulations of the Lawn Tennis Association.
2. To arrange and regulate inter-county matches, county championships, tournaments, inter-club and county competitions and junior activities including training.

3. To raise and then employ the funds of the Association in such a manner as shall be deemed in the best interests of the game.

4. To carry out all other activities considered necessary or desirable by the Association in connection with tennis in the county.

5. Subject to the rules of the LTA, to make, amend and revoke rules and regulations for the control and governance of the game in the county and for the disciplining of players, officials, coaches and others involved within the game, and to comply with and uphold these rules.

6. To accept all duties and powers delegated to it by the council of the LTA and to appoint representatives for the county to the council of the LTA to express the views of the county at meetings of the LTA in accordance with any rules, regulations or bye-laws of the Association.

7. To arrange, purchase and distribute tickets allocated to the county for the All England Tennis Championships at Wimbledon.

Respondent Six, who is chairman of one of the larger county LTA associations, described the regional LTA structure as the “delivery arm of the LTA”. They are a major interface between the National Governing Body of the LTA and the service providers, e.g. clubs, parks etc. They may or may not own their own facilities but will certainly have access to facilities for county-level coaching and training.

Private Clubs

Organisations and Objectives

There are 2,600 affiliated tennis clubs in Great Britain. They range in size from two courts to clubs with many courts, both indoors and outdoors. Most clubs do not have a mission statement or objectives. Regardless, whether they have published objectives or not, their overall raison d’être is to provide facilities for their members to play tennis, either socially or competitively. As a crude generalisation, each club will own its own land or rent or lease the land from the local or parish council (Respondent Fourteen) or commercial land agent (Respondent Seventeen). Again, typically, the club is privately owned and may or may

---

5 The author is aware of a club with two courts and has not found a club with only one court but it is possible.
not be a limited company. It will tend to have the ubiquitous tennis club committee who oversee the running and finances of the club. In all but the biggest clubs the committee will be made up of volunteers who give their time freely and without charge. All clubs need to abide by the articles of their association and this includes such things as holding an annual AGM and publishing the audited accounts. In the larger clubs there is likely be a more professional approach to management and they may even have a full-time professional manager who is paid by the club (Respondent Three, Respondent Twenty). There will be exceptions to the rule but there is no ruling about what forms a club and what clubs do or must not do. The latest Clubmark initiative from Sport England and the LTA does start to try and enforce a number of standards around club management, but is not prescriptive in a number of areas.

In order to be affiliated there needs to be a minimum of 20 members, and they pay an affiliation fee to the LTA via the regional county LTA. For that they will enjoy the benefits of being able to compete in the local and national club leagues; the regional LTA will help with developing the clubs’ facilities and can help with grants and loans. They will be able to offer advice on coaching and local marketing. They can also offer free liability insurance cover which would cover personal injury in the club environment. Last, but by no means least, they will receive the LTA official newsletter and will receive an allocation for tickets at Wimbledon, depending on the number of members, although at the time of writing the LTA have said that the allocation will stop in its current form to be replaced by a fairer method of allocation, but this has yet to be announced. By its own admission (Lawn Tennis Association, 2006) the LTA’s reputation with clubs is poor, and few committee members, let alone ordinary members, are able to testify the benefits of LTA-affiliation, aside from the yearly Wimbledon ticket draw.

There is a second classification of private clubs, which are those that are not LTA-affiliated. As they are not affiliated they have no governing body and as such are extremely difficult to track down. For the purposes of this research: firstly, they do not represent a significant portion of the population under consideration; and secondly, there is no reason to believe they would have any different systems from the ones already under discussion and they would represent a subset of the systems already under review. This was also confirmed by Respondent Eighteen who was an LTA County Development Officer and familiar with the affiliated and non-affiliated clubs in her region.
Schools and Universities

Organisations and Objectives

The administration of tennis at schools and universities varies enormously and is hard to draw even simple standards for how it is managed and progressed. There are pages on the LTA website which promote the LTA’s involvement and their support for schools. The LTA also promotes the British Schools Tennis Association which runs a national competition each year, with regional knock-out rounds and a finals week in July. However, there is no website and this category is not mentioned in the LTA’s blueprint document (Lawn Tennis Association, 2006) – surely a major omission.

The other government agency involved in this section is the Department for Education and Skills (DfES) who also run a scheme for gifted and talented tennis players. The DfES offers talent ladders and training camps for the national squads of various sports. It is aimed at school pupils in Year 6 and Year 7. However, where tennis is concerned this is run in conjunction with the LTA or regional LTA.

Schools and Universities represent an important body of people from a tennis development perspective, but the systems they use are bespoke to the education environment and are therefore outside the scope of this investigation. In a written response by the DfES they stated that they do not have a central system which manages tennis. Although the internal systems of schools and universities are outside scope, one area that has been raised by a number of respondents is the Physical Education Schools Sports and Club Links (PESSCL) which was referenced by respondents of clubs, county and Local Education Authorities. The PESSCL is discussed later on in this section as part of the scale-free networks value chain as it can be described as a hub within the overall landscape of the playing population.

Commercial Organisations

Organisations and Objectives

The number of companies that offer tennis facilities plus other health facilities such as a gym, or swimming pool has grown over the last two decades. One of the most successful has been the David Lloyd centres which are now owned by Whitbread. They now have 58 clubs in the UK and over 480 courts, which are a mixture or indoor and outdoor courts. Clearly this is a profit-based organisation with a stated objective of growth but also a major component in the
playing of tennis in the UK, with over 350,000 members. Other organisations such as Next Generations Clubs and Esporta have also started along similar lines.

As a profit-based organisation they are commensurately more expensive than the privately owned not-for-profit clubs. A typical facility of this nature such as a Next Generation facility would include indoor and outdoor courts, as well as squash, table tennis, aerobics and swimming pools, plus restaurant and bar facilities. The LTA recognises the growth in this sector in their blueprint document, although they do not mention how they intend to work with them – if at all. Three respondents made comments directly and indirectly about private clubs. Respondent One made the comment that there is not a performance structure and they are all about “bums on courts”. Both Respondents Two and Six made comments about people wanting good facilities when they play tennis and the clichéd image of the wooden pavilion next to three courts was not what people wanted any more. This implicitly assumes people now have the leisure time and disposable income to be able to afford private club membership, however that is the subject of another dissertation. Respondent Two made the comment that private clubs do not have a lot to offer the development of the sport as they are so exclusive and expensive. The commercial organisations also have the capability to be LTA-affiliated but they do not affiliate by the number of members as in the private club world. Instead they affiliate by the number of courts (Respondent Fifteen). Although this is not helpful from a perspective of knowing who the people are who play tennis, it is understandable because the typical affiliation model is by the number of members. Commercial clubs tend to be multi-sport and therefore the number of members is not necessarily typical of the number of tennis-playing members, and could be over-inflated.

**Locals Councils/PPP**

**Organisation and Objectives**

Most people’s first experience of tennis is playing in the local park. According to one respondent the council does not have a legal obligation to provide local tennis facilities but each council in Britain does provide local access to some degree or other. Some councils provide free or subsidised coaching as well.

There are two distinct flavours of council provision that are relevant to this discussion. Firstly, there are the courts that are provided by the local council directly. Courts are provided as part of the local parks facilities and range greatly from well run facilities through to a small
number of courts in poor condition due to lack of investment. The second sport provision is when the council forms a partnership or subcontracts the management of sports within the local area. This is also known as PPP, or Public Private Partnership. There are a number of different arrangements with the private sector in this category. Two are highlighted as being of significance: Firstly, the contract is wholly subcontracted out. This is the case with a company called Leisure Connections, which currently operates over 80 sports and leisure facilities on behalf of the local authorities. They provide a large number of other facilities, including tennis, swimming, and in some cases local theatres. They are what might be described as a halfway house between the commercial operations and the local council provisions, as they offer a specialist sports management facility on behalf of the council. A number of councils outsource their leisure facilities to a wholly owned subsidiary or independently run trust. This is a non-profit-making organisation that is autonomous and can bid and run leisure services for other councils. There are several examples of this type of organisation, including Welwyn and Hatfield Leisure. Such organisations should provide standards of management and equipment comparable with the private sector, but without the private sector prices.

A second example of council/private sector cooperation is when the organisation takes on the running of the local court or number of courts. Two examples of this: firstly Respondent Four runs the local courts in an inner-city tennis initiative. He runs and maintains a number of coaching facilities and sets up the booking process by which the general public can book courts. He then pays rent to the local council, effectively for the courts. Secondly, Respondent Three, who is chairman of a large tennis club in the South, where the club has taken on the management of a number of local facilities on behalf of the council as it has the staff, systems and coaches to enable them to make this possible.

Other Organisations

Sports Development Partnerships

The local sports development partnerships provide the strategic delivery and funding for Sport England across all sports. They have very similar goals to a number of organisations in that they want to increase participation, improve levels of performance, widen access to sport, and thereby improve health and well-being. They have no direct delivery of tennis within the scope of this research and, therefore, they are not included any further in this investigation.
**Institute of Sport and Recreation Management**

This institute provides a professional members’ association for those involved in leisure management provision. They are a national body and provide an association for those in leisure management who wish to develop their career in sports management. They also sponsor and support research into medical, technological and management research, and make people aware of these results. In a similar way to the sports partnerships they encourage sport so as to benefit the health and social development of all people, and they provide training for those who work in the industry. Although a number of their members will be involved in the management of the tennis centres, they do not have direct bearing on the provision or management of tennis within the scope of this research, and they are not included any further in this investigation.

**The Central Council of Physical Recreation (CCPR)**

The CCPR has the following defined objectives:

a. Is the umbrella organisation for the national governing and representative bodies of sport and recreation in the UK
b. Speaks and acts to promote, protect and develop the interests of sport and physical recreation at all levels
c. Is at the forefront of sports politics, providing support and services to those who participate in and administer sport and recreation
d. Is completely independent of any form of government control
e. Has no responsibility for allocating funds
f. Is strictly non-party and will support or oppose proposed measures only on the basis of their perceived value to sport and recreation

In the past the CCPR was a significant organisational body in UK sport and indeed owned a number of significant sporting facilities (Crystal Palace and Bisham Abbey, as examples) but, following a number of reorganisations of UK sporting bodies, they now have no ownership of facilities and no funding responsibilities. None of the respondents mentioned the organisation, and it would fall into the category of a strategic body and not have any operational responsibility and as such is not included any further in this investigation.

**The British Tennis Coaches Association**

The BTCA is an independent trade association which represents its membership, consisting of approximately 3,000 coaches. It has no accreditation facilities and seeks to
provide impartial advice to coaches and assistant coaches. It has no operational responsibility and acts in a similar way to the CCPR and is not included any further in the research.

**Charitable Organisations**

The other principal area which is omitted from the Game Plan organisation chart (National Strategy Unit, 2002) is charitable trusts. As the name implies they are set up and run as charities. Two organisations were highlighted as part of the research: the British Tennis Foundation and the Dan Maskell Tennis Trust. The goal of the British Tennis Foundation is to fund and initiate programmes which promote tennis in the community and amongst disabled groups. Anecdotally, wheelchair tennis is becoming more popular, and Britain has some leading exponents of the game. The Dan Maskell Tennis Trust is closely associated with the BTF and also focuses on disabled and disadvantaged people, specifically wheelchair tennis, deaf tennis and tennis for people with learning disabilities. Both organisations are closely linked with the LTA and they are both located in the LTA offices in Roehampton.

Charitable organisations are not listed in the Game Plan model. There is no reason why they are omitted but they neither have any strategic remit within mainstream tennis nor any operational remit, and are therefore not included in the major part of the research. The findings of the thesis could be used within this group as they would benefit from the recommendations but this is not the main focus of the research.

**Conclusions**

The organisations involved have a wide variation of size and ownership and strategic and operational responsibilities. The public bodies such as the DCMS, Sport England and UK Sport have a national remit to promote and fund sport to improve either the lives of society by “increasing and broadening the impact of culture and sport” and to promote the high performance of our elite sportsman on an international stage for the “mega events” such as the Olympics, the various World Cups etc.

The LTA, as the National Governing Body, has a special role in the organisation structure and therefore has a responsibility to promote, develop and manage the sport at all levels. It does this via its operational arms, i.e. the regional branches of the LTA. Private clubs, commercial clubs and council organisations provide the facilities for the major part of the tennis-playing public; however, the clubs and commercial organisations that are affiliated
are independent organisations and do not “report” to the LTA. Similarly, the local councils that provide tennis facilities have no formal link to the LTA and need not even be affiliated. This highlights the issues that there is no central decision-making body across the organisations concerned. They are financially independent bodies and therefore are autonomous regarding any decisions concerning usage and purchase of systems as the prime example for the purposes of this research.

This section discusses the organisations as individual entities, but the research questions identified that it is the linkages between the organisations that are required to progress the research in order to populate a value chain model. This is in order to interlink with the ERP system and therefore determine the extent to which an ERP system could be utilised.

6.1.3. Value Chain Linkages

This section analyses the interactions between the organisations identified in the previous section. It uses an axial coding approach referenced in Chapter Five. The purpose of this section is to look explicitly at the information provided, via interview and secondary data sources, and to identify the interactions and systems in use and how they are applicable to the research.

The axial coding analysis is described as “the focused sampling of people and places and situations which will provide situations which provide opportunities to gather data about the properties and dimensions of the categories as well as how the categories are related to each other” (Easterby-Smith et al., 2002).

Due to the high number of entities and the complexity of linkages it is impractical and unnecessary to perform an analysis on all possible linkages, known in relational database mapping as an “any-to-any” analysis. The analysis will therefore focus on the key elements within each section as identified by respondents, and also from a structural linear progression. Also, it is important to note that linkages covered in each section are bidirectional, therefore the analysis of a particular item is only covered in one section e.g. the linkage of ‘players<->coach’ is the same as ‘coach<->players’ and is only referenced once. The breakdown of linkages is shown in Table 9.
DCMS<>UK Sport/Sport England

The DCMS has links with UK Sport and Sport England due to its position as the government department responsible for Sport in the UK. It provides the direction and funding for UK Sport and Sport England at a strategy level. Note: the DCMS had no other significant interactions with any other organisation.

LTA <> Strategy Groups (DCMS, UK Sport, Sport England)

The strategic sports bodies are the government bodies that guide and set direction for all sports at a high level. In the case of UK Sport and Sport England they also provide funding for the various NGBs of their specific sports. In the case of the LTA they obtain a over 50% of their actual revenue from the All England Lawn Tennis Club Championships (Lawn Tennis Association, 2009), more commonly known as Wimbledon and from commercial sources from advertising and sponsorship. From a systems perspective these are not operational links. They are strategic and funding-based transactions which are about obtaining funding to build more indoor tennis courts in conjunction with Sport England, the Sports Development Partnerships and the local regional LTA where appropriate. The linkage is not about day-to-day transactions but about communications and funding.

Sport England<>Regional LTA/LTA-Affiliated clubs
A number of respondents mentioned that they had some interactions with Sport England. This was regarding funding for major projects which concerned buildings or groundworks including items such as new or refurbished courts. There was no interaction concerning playing tennis.

**LTA <-> Regional LTA**

As identified in previous sections there is an extremely strong link between the regional LTA and the central body. Depending on the size of the county in question there is likely to be a county office which may be staffed by paid or volunteer personnel. Certainly the regional LTA has access to the central systems run by the LTA, as described in a previous section. This is an extremely important linkage because the regional LTA is effectively the operating arm of the organisation for the vast majority of its activities. One of the initiatives that have gone live in recent months is the Siebel database initiative (Respondents Six and Fifteen). This has allowed the LTA to tidy up its address database. Prior to this they would mail people two or three times as they were on separate systems and they were not reconciled. This system has now gone live, eliminating the duplication to a large degree. This was also discussed in the organisation analysis theme for the regional LTA.

Respondent Twenty-Five said that one of their priorities is to bring existing county websites under one framework which, they say, will improve the consistency of information about the game available to the tennis stakeholders.

**LTA<>Players**

The LTA has a pivotal role in the provision of tennis in Great Britain. In a similar way to the regional LTA it works at the elite level as well as having the responsibility to promote and develop the game at a national level.

From a systems perspective there are two important systems run by the LTA to track and manage performance and to encourage competition.

Firstly, there are the LTA rankings. The national rankings provide a ranked order of players based on tournament results and is updated every two weeks based on results fed to the national LTA. From the LTA website, the top players can be listed in the UK based on their performance in LTA approved rankings tournaments. This can be further segregated by sex,
county and age. This shows the position of players based on the number of points accrued and can then be used to sort and display the relative position depending on the category selected, e.g. national or county.

Secondly, there is the ratings system. The ratings system provides a player with the ability to compare themself with other players. There is no restriction concerning the number of people in each rating group. There are ratings from one to nine and subdivisions within each rating, plus there are ratings tournaments, and these results are fed back to the LTA. The ratings system is very complex and certainly two respondents felt it was overly so. The main issue with the ratings system is that it is updated only twice a year – effectively it is published in June for the summer and then updated again at the end of the season. This does not allow for major changes to be made during the year and, as there are so many categories, it is entirely possible that, for juniors in particular, results could move dramatically in the six months between runs. According to the LTA website there are around 2000 ratings tournaments a year, of which the majority would be played in the summer, so the ability to have more up-to-date information would seem to be advantageous for all. The researcher’s own experience is that the website crashed a number of times on the first day of the update, which was probably due to the volume of people trying to check their ratings. Although this usage shows considerable interest, it is very difficult, from a capacity-planning perspective, to be able to plan for these peaks, while the system is probably little used until the next update.

Players <-> LTA-Affiliated Clubs

This is perhaps the classic model of how British Tennis is perceived. There are over 2,600 affiliated clubs in the UK (LTA, 2007a). These tennis clubs provide a very important place in the provision of British Tennis, but they are not the only method and they do have their critics. Respondent One: “I can’t join a club because it’s too expensive and I can’t play as there is nowhere I can get in a club and I go to my local park and there’s nothing.” Respondent Two: “Tennis has certain favoured courts and you always have the volunteer mentality of tennis clubs whereby the people who put the money, the effort in feel it’s their club.” Respondent Two: “People like this idea of closed shops ... you see the same 4 people playing for the same club for years – that’s why new members are not always welcome as they might take your place.”

In terms of systems between players and LTA-affiliated clubs, there is no single system in use but a multiplicity of systems, each system provided by the club in question.
Players <-> Council/Local government provision

It is estimated that there are approximately three million tennis players in Britain (LTA, 2007a) of whom approximately 80% do not play at clubs as referenced by Respondents Two and Six. This leaves around 2.4 million people who play tennis on a regular or infrequent basis around the country (LTA, 2007a). They play at approximately 18,000 public courts in the UK which are potentially either world-class facilities, or park courts with torn nets and broken surround netting. There is a general view of under-utilisation except during the two weeks of the Wimbledon tournament (Lawn Tennis Association, 2006).

From a marketing and systems perspective the major issue is that no one knows who these people are. There is a section of the tennis public who may be Advantage Club members of the LTA, but there are only 90,000 registered members and they are likely to be club members as opposed to park players.

In one instance, a local club which has effective systems has taken on responsibility for the management of four local authority parks sites, and is able to offer the benefits of its online booking facility out to the wider community. This is the exception rather than the rule.

Similar to the LTA clubs and players section above, there is no single system in use, but a multiplicity of systems provided by the councils in question.

Players <-> Commercial Clubs

This is one of the growth areas of the leisure industry: not specifically commercial tennis clubs, but the whole area of fitness and private leisure enterprises. Respondent Six was of the view that commercial clubs allowed a level of facilities that is not always found in the private sector clubs.

From a systems perspective they offer a similar picture to the systems and facilities as discussed in the Players<->LTA-affiliated clubs section. The principal difference is that the level of service, facility and court availability should be of a higher standard, albeit at a higher cost.

Players <-> Coaches
There are 11,000 active coaches in Britain, of whom 3,140 are affiliated to an LTA club (Lawn Tennis Association, 2006). They range from people who are professional coaches who teach at senior levels, to coaches who are attached to medium to large clubs who receive a retainer.

Due to the independent nature of the profession there is no common system in use. The coaches who are truly independent do not have a need for complex systems (Respondent Five) as they are offering a virtually one-to-one service and their clientele base is not very large.

Where there is a larger operation then the needs for systems start to be apparent. In an inner-city initiative where a coach has set up an operation (Respondent Four) he rents the courts from the local council in six separate locations. With multiple locations and multiple coaches, the need for systems has meant that he has developed facilities for taking bookings, renewal letters, managing courts and taking payments. This consists of software that has been designed on a bespoke basis but has been designed in a way that allows a great deal of flexibility without depending on the software developer to make changes. This means that a large number of parameters can be changed without recourse to expensive development time. This organisation also offers this facility both via telephone bookings and an online internet facility as well. Although this initiative has been set up to run and manage coaching and courts in an inner-city location they also provide coaching for some local private clubs.

**Players <-> Regional LTA**

It is worth differentiating the elite players from the social players at this point in the research as they will be treated significantly differently by the regional governing body and the governing body (discussed in the next section). Respondent Six (Chairman of a regional LTA) said: “We want to encourage the best juniors to be doing things and make sure no one slips through the net of talent.” This means that the regional LTA are focused on developing junior talent and they have performance squads in order to achieve this.

From a systems perspective the regional LTA would either use the LTA CRM system to track personal details, or they may use their own system that has been developed prior to the LTA solution (Respondent Fifteen).

**Coaches <-> LTA/ Regional LTA**
The LTA recognises the challenge of the management of coaches. As mentioned in the previous section they are mostly independent operators, and they therefore have associations and affiliations with the LTA as opposed to direct control. Apart from a small number of elite coaches, such as Andrew Murray’s previous coach Brad Gilbert, the LTA does not directly employ the vast majority of coaches. The LTA also recognises this complexity of differentiation, and highlights in the blueprint that it cannot distinguish coaches based on capability, track record, experience, age group focus, player ability suited to lifestyle preferences, etc. The LTA also identifies that it does not have the processes and procedures to manage the number and diversity of coaches (Lawn Tennis Association, 2006).

From a systems perspective, the coaches are a very fragmented body of people who do not work directly for the LTA and therefore do not have specific systems for management. The LTA does provide information for everybody to view on its website on the ratings and rankings of players, which would also be available to coaches, but this is not designed specifically for coaches and is more for individuals to check their own county/national performance and position.

The LTA does hold a database of coaches in its central system which is available to the regional LTA. However, it is not clear on the usage of this information. Respondent Fifteen was of the view that the database was closer to an address book than a system useful for CRM or marketing purposes.

As described in the previous section, coaches play a key role in the development of tennis. They have a role as educator but also as a role model to aspiring players of all ages. One of the interesting comments about coaching (Respondent Eight) is the ability to reach a certain level: “It’s the same with swimming, with a sport unless you reach a certain level of attainment within it, you don’t get a lot of value out of playing it. Not get anything from it and if you don’t get value, if you don’t get fun out of it, then the opportunities of achieving in it are pretty low. So that’s a threshold that you have to cross before it becomes enjoyable.” Certainly with tennis the amount of time spent collecting the ball can exceed the length of time spent in a rally.

Within the coaching arena there are virtually no modules listed in the ERP module description in Chapter Three that are applicable. The only technology identified is the use of
video capture and replay tools which allow coaches to analyse players on a stroke-by-stroke basis.

**Coaches <-> Commercial Clubs/LTA-Affiliated/Councils**

Coaches range from a single person who coaches individuals or groups at local facilities, to coaches who have small businesses and hire other coaches to increase their local coverage. The systems in use will depend on the size of operation. Respondent Five is LTA-qualified and coaches individuals and small groups at his local club because he enjoys it, and in some cases his charges are negligible or non-existent. A number of clubs have a coach attached to the club as the professional, in a similar way that golf clubs have a resident professional. It is hard to generalise on the monetary arrangements, but quite often they will have an exclusive arrangement and/or be paid a small retainer. In this instance the incidence of systems is very small and likely to be limited to spreadsheets and simple business systems. The other example is the coach who runs a small coaching business and offers tennis coaching in conjunction with the local council (Respondent Four). In the latter instance he has developed systems to support the logistical operation of booking individuals and groups, which include facilities for payments and online facilities. Similarly, Respondent Nineteen employs two full-time coaches and two support staff members.

**Commercial Clubs <-> LTA/regional LTA**

Commercial clubs affiliate in a slightly different way to private clubs but they can still become members of the LTA. As the affiliation is based on the number of courts then the LTA would not know who the members are. Typically, they have their own in-house systems to support their operation. Although they have a different funding and organisation objective, as discussed previously, they are from a systems perspective not intrinsically different from the larger clubs, as referenced by Respondents Three and Twenty.

**LTA-Affiliated Clubs <-> LTA/Regional LTA**

This linkage engrosses the largest component of the membership of the LTA. As of 2009 this was estimated by the LTA to be 657,000 club members over the age of 16 (Lawn Tennis Association, 2009). There is no single system that clubs can use from the LTA or regional LTA. There are examples of regional LTA websites offering limited facilities to clubs but they are restricted to their county and are not nationwide.
The numbers of tennis players in the UK has been mentioned previously– there are some 2.4 million tennis players about whom the LTA has no information. When a member joins an LTA-affiliated club, without the member necessarily realising it, a sum of money is sent to the county association and a smaller proportion is then sent on to the national LTA to affiliate as a member. What this means is that the LTA and regional LTA can now quantify the number of members that belong to that club (Respondent Six). What the LTA does not know is any details about that person. All the membership details, as described above, are held at a local level. A secondary, but important, issue is that keen tennis players may belong to more than one club. It not uncommon for a keen player to belong to a club for the team and match play, for example if they are in a top league or tournament, and also belong to another club for its better social or indoor facilities. In this instance the player, via the club, will have paid his affiliation fee twice and the LTA will have double-counted.

**Local Council <-> DCMS**

One council (Respondent Sixty-Three) referred to the DCMS as receiving emails and also linking to the indicators that they set out. Additionally, one other council (Respondent Fifty-Eight) referred to sending statistics on court usage, which is discussed in the coding analysis in the next section under Organisations. However, the majority of respondents said that they had no interactions with the DCMS.

**Local Council <-> Sport England**

A number of respondents mentioned working with Sport England concerning funding, but there was no interaction recording concerned with tennis playing or coaching activities.

**Local Council <-> UK Sport**

One respondent (Respondent Sixty-Two) said that they received information concerning seminars but this was exceptional.

**Local Council <-> Schools**

The links in this section concerned programmes working with schools via PESSCL, as discussed in the previous section. Other interactions were with Sports Development Partnerships which are similar in concept to the PESSCL. The alternate view from Respondent Forty-Nine was that they would like to do more with schools.
**Local Council <-> LTA/Regional LTA**

The LTA has a number of interactions with the local council on different aspects. Respondent Eighteen (in their role as club development office for the regional LTA) held monthly meetings where they would “meet up with the sports development officers in the councils. They would organise things themselves and ask us for coaches and we would promote it as well. Depends whether it is a designated a priority.”

Respondent Twenty-Five commented that communication with the council tended to be at the county level, which endorses the last quote from Respondent Eighteen. However, the report of grassroots tennis (SMC Consultants, 2007) says that the LTA’s relationship with the Local County Authorities and County Sports Partnerships is weak. They go on to say that “there is a limited understanding of the main issues and a lack of business/financial information on tennis delivery models. This makes it difficult to sell tennis to the public sector” (SMC Consultants, 2007). Certainly, the representative of the County Sports Partnership interview (Respondent Eight) felt their relationship with the LTA and the County LTA was at more of a strategic level and they would not get involved at an operational level, i.e. they would have no interest to “sell tennis to the public” per se.

**Schools<->LTA-Affiliated Clubs**

There is a government initiative called the Physical Education Schools Sports and Clubs Links (PESSCL). This is run by the DfES and is an attempt to improve the links between clubs and schools. A lot of schools do not have sports facilities and they are available nearby at local sports clubs. This was referenced by the Local Education Authority respondent (Respondent Twenty-One) and a number clubs (Respondents Four, Fifty-Three, Fifty-Nine). There were no systems referenced by the respondents interviewed.

**Conclusions**

The linkages analysis confirms the independence of the organisations. There are no umbrella organisations that cover all aspects – the LTA at best covers clubs but does not cover councils or non-affiliated commercial organisations. Similarly, there are no all-encompassing systems involved. Again at best there are systems that cover regions from the regional LTA or the relevant council but these are not prevalent. This information is also used to populate the Value Network diagram later in this chapter – see Figure 14.
6.1.4. Open Coding Analysis

Using the data collected from the research interviews, this section looks at the responses from the interviewees structured as per the coding themes identified as discussed in Chapter Five.

The coding themes as described previously are clubs, non-clubs, coaching, competition, IT systems, organisations and websites. The subjects that are relevant to Research Question One are clubs, non-clubs, coaching, competition and organisations and these are discussed below. The following sections are organised into principal issues and others. This differentiates issues that are progressed further on in the research from those that are less relevant.

Organisations

Principal Issues

One of the main themes that resonate through the thesis is the number of organisations involved in the provision of British Tennis. The comments from respondents reflected not so much the number of organisations but the communication between them. Respondent Eight commented that there was “quite a fragmented structure of sport within England”. This was also reflected by Respondent One who commented that the organisational structure was very complex and that not many people know anything about any of organisations involved. Certainly the communication between organisations would seem to be an issue. Respondent Two, when asked how the organisations talk to each other, responded that “they do not really”. As mentioned before, there was a lack of clarity about the role of Sport England and UK Sport. Additionally, there is a significant number of organisations involved in the delivery of sport, all of whom have their own objectives which one would assume to be broadly in line with the three principal goals of the Game Plan (National Strategy Unit, 2002).

As mentioned in the previous section, Sport England is concerned with the strategic implementation of sport. Respondent Eight commented that they were more strategic than operational. This principally manifested itself by comments about funding for infrastructure initiatives (Respondent Fourteen). They are also very health-related, as mentioned by Respondent Seven. The comment from Respondent Seven was that “Sport England is totally community sport focused, and in fact more health-related than anything else.” In this role they
do not have any obvious operational responsibilities and would therefore not have any requirement for access to, or to run, large-scale ERP systems.

The DfES would not participate in an interview but did write to say that there was no central system in use by the department. This was confirmed subsequently by the interviews conducted with representatives from further and higher education.

A significant proportion of the substantive comments categorised under this heading was concerned with the interrelationships, which is covered in the value chain linkages on page 112.

**Other Issues**

There were comments concerning the fragmentation and bureaucracy within the game. This was commented on by two respondents who thought that organisational structure was complex and that not many people know anything about the organisations involved. This could also be reflected in the sheer number of organisations involved. Certainly, there was confusion between the roles of UK Sport and Sport England, which was not clear to the grassroots interviewees. The grassroots tennis review highlighted that the County Development Officers (CDOs are full-time county officials employed by the LTA/Regional LTA) have been strangled by too much paperwork from too many poorly thought-out initiatives from Head Office.

There is another initiative called the Tennis Clubmark. This initiative was originally devised by Sport England in order to improve the governance of the clubs. This would include items such as diversity policy, volunteer guidelines, job descriptions and other areas principally intended to improve the management of the club. Unfortunately this is seen as another administrative overhead, and is not considered a success process in developing the sport. Indeed, there was a previous initiative called Club Vision which appears to have a significant overlap with Clubmark and yet is still trying to be enforced. As Respondent Twenty-Four commented “you could get a good Clubmark score and still have a shrinking sport.” This point was also highlighted by the LTA Community review which said that “the LTA has taken a dictatorial approach to developing the sport with little consideration to local needs.” The Clubmark approach is a case in point, where if clubs do not obtain Clubmark accreditation they will not receive funding and grants for Mini Tennis and other initiatives which are vital to the development and support of many clubs.
Coaching

Principal Issues

Coaching was regarded by a number of the interviewees as one of the key aspects of the whole tennis experience. Certainly, the opportunity to be taught properly right from the beginning was seen as key to good technique and progression through the sport, especially for younger players. Respondent Seven commented on the technicalities of the sport and the requirement to be able to reach a certain standard to be able to get real enjoyment out of playing, else you spend your time picking up the balls from the back of the court. The LTA employs a number of coaches but by far the most coaches were independent, yet still have LTA-recognised coaching awards. In terms of systems to support the coaches there are very little. Respondent Nineteen got to the point where he took on admin staff in order to manage the volume of calls, enquiries, bookings, etc. One of the issues raised concerning coaching was the provision of coaching on the public courts. As discussed under the facilities section, not only are the courts probably not well maintained, there is no one to collect booking fees and there is no consistency around the provision of coaching or organised play. The systems used to support the independent coaches reflect the systems in use by SMEs of this size, e.g. spreadsheet, word processor and possibly – though this is more unusual – a small CRM system. In terms of central systems to support them there was very little referred to by respondents or by the LTA.

In summary, the opportunity to be taught correctly from the beginning was seen as a basic building block to good technique and progression through the sport, especially for younger players.

Other issues

One of the more innovative areas for the use of technology is the use of video coaching techniques. This allows detailed analysis of shots by the coach with the player and can also be used to do side-by-side comparisons with top players such as Federer, Sharapova, etc. Although the use of the video equipment is getting easier and more readily available, the technology and packages to upload and analyse are still beyond the reach of the average coach who really wants to spend more time on court than learning technically complicated video formats. Storing video data against a pupil would help with the analysis of the player’s game over time and, although this would be possible under a CRM or integrated ERP system, it
would be unlikely to be considered a priority requirement during the early stages of a system implementation.

**Competitions/Tournaments**

**Principal Issues**

One of the main issues was the availability of up-to-date data. This is covered in greater detail under IT systems later in the chapter. The ratings and rankings are updated either every two weeks or every six months but the availability of tournaments results in a central database that is available to all is a feature that would be of great interest to players and supporters alike. This is available for the Grand Slam events at a great cost, but the LTA have the beginnings of a similar capability with the tournament software that they promote on a discounted basis, which has an interface to upload information centrally.

**Other Issues**

The comment from the LTA Community review document was that “tennis has lost its appetite for competition, we have become a coaching nation”. This was echoed by a number of respondents. Certainly the comments about the British ethos regarding competition was different for other countries, notably France (Respondent Six), where singles is the more dominant game and leagues and ladders are much more prevalent (Respondent One). The Ariel Mini Tennis initiative has recognised this as it is not just about coaching, although this is a large part of the programme. Ariel Mini Tennis players are also encouraged to play interclub matches and enter tournaments. One telling comment from Respondent Twenty-Four, who is also the parent of a junior performance player, is that “The demand for competition is huge. The LTA is getting it so wrong in not sustaining that interest.” Additionally the ratings structure is very complex (Respondent Four) and this means that entering the tournaments can be quite a daunting experience to the uninitiated.

The community tennis review highlighted that “There is a lot of emphasis on the performance aspect of the game as opposed to taking a broader and sounder and more competitive base on which all players of all ages can build their game.” It is hard to tell from this statement if they are for or against more competitive tennis.

There is a tournament in the South East called the London Parks Tournament, which is open to all players within and around the M25 region. The intention is that this tournament is
played on club or park courts in that area. However, this year it attracted an entry of fewer than 128 players for the men’s singles event and fewer than 64 entries for the ladies’ singles event.

One of the issues raised was that the clubs and parks structures do not engender competitive tennis which is needed to create top players and also to encourage club players to play more competitive tennis. One concern raised was the fact that clubs encourage the playing of doubles due to the pressure on the number of courts at key times, plus it is a more social game which is physically less demanding than singles, and is therefore more attractive to the more mature player. The mental approach to singles tennis is completely different to playing doubles. There are very few top-class players who have won major events at both singles and doubles as the physical exertion required to play singles would mean that playing doubles would not allow sufficient rest and recuperation time (apart from any scheduling issues) in a big tournament.

The counter side to this is that some people simply do not want to compete and prefer to play tennis for the pleasure and social aspects. It is not uncommon in clubs to find the same four people playing at the same time each week – they may change partners but that is their regular four and that is what they stick to.

**Clubs**

**Principal Issues**

The principal issue concerning clubs is that the LTA does not have information concerning its 675,000 members (Lawn Tennis Association, 2006). The detailed membership details are held by the affiliated clubs although there is no consistency as to how this data is held, as is reviewed as part of Research Question Two into IT systems used.

**Other Issues**

The LTA has 3,600 clubs registered as being affiliated organisations (Lawn Tennis Association, 2006). This is in addition to commercial organisations such as Esporta and David Lloyd, as well as clubs which are not LTA-registered. The club structure offers a number of facilities and components that are not found in council or commercial organisations.
Clubs offer an environment where people can play social, non-competitive tennis (albeit the competitive element is internalised, i.e. who beats who but just in a small group of friends on a Sunday morning. (Respondent Seven)). This element of what is commonly called “set fours” was also mentioned by two other respondents (Seventeen and Twenty-Four). Set fours are where people tend to play at the same time each week with the same people.

Clubs now have greater commercial competition than in previous years with the advent of commercial organisations where the facilities offered are far more extensive than small, privately owned clubs can offer. They will typically include indoor courts, gym, possibly a swimming pool and a restaurant. However, this all comes at a cost and is only for a small number of people who can afford it. It does mean that the benchmark for what people expect at a local facility has been raised and the days of clubs with just a hut by some courts is moving on (Respondent Six).

While some clubs may not provide high-level facilities, they do offer the basics in order to play tennis, i.e. tennis courts and a social environment, LTA clubs will typically offer some form of competitive tennis, whether that is internal competitions or interclub team tennis (Respondent Twenty, Fifty-Nine).

Coaching is seen as important in a club environment (Respondent Nineteen) and is seen to differentiate the clubs from council facilities (coaching was discussed previously in this section).

**Non-Club Tennis**

**Principal Issues**

According to the LTA and referenced by two respondents (One and Six) about 80% of people do not play in clubs (LTA, 2007a). The largest source of non-club tennis courts is provided by the council or council-outsourced facilities, i.e. wholly outsourced organisations or Trusts. These would be the players who are unlikely to belong to a club and who play on a casual basis. The issue is that these are players where neither the LTA, clubs nor, in most cases, councils have information concerning these people.
The ability of some councils to be able to maintain tennis courts is a considerable issue. According to Respondent One, tennis courts are being turned into skateboard parks or five-a-side football pitches because the councils can’t afford the upkeep. Unless the person who collects the booking charge is also part of another function then they are unlikely to be highly cost-effective. This was noted by Respondent Two who commented: “Tennis courts are extremely uneconomical to run from a park point of view because the real cost would be more than actually people want to pay.” Indeed some facilities are not even manned during the winter months as it is simply not economic to do so (Respondent Thirteen).

Respondent Six noted that “With local authorities the main difference is that the indoor leisure centres are run by people who have probably done a diploma in leisure studies whereas the outdoor leisure centres, the big parks with tennis courts and pitch-and-put and all that in them are managed by gardeners and probably someone from the council who it is one fifth of their job.”

Similarly these courts do not provide any other facilities that raise the tennis experience. These (as cited by Respondent One) include the fact there is no social scene, there is no competitive tennis and there is no programme of events.

The ownership of the courts can be an important aspect for clubs. Although not specifically raised as an interview theme, the respondents on behalf of clubs did mention their particular ownership issues. One respondent mentioned that they rent/lease the courts from the King George IV playing field association, they pay a peppercorn rent and, being on green belt land, they believe that they are relatively protected from potential developers. Respondent Seventeen, however, mentioned that the lease on their club would expire in under twenty years. They are a city club and therefore the grounds are prime land for development and they were currently trying to negotiate an extension in order for the club to continue. One aspect of this short lease expiration is that they are unable to get loans or grants from the LTA or Sport England. This means that any substantial development will not be completed, or will need to be funded via other methods.

Respondent Six also highlighted the comparison of facilities with the commercial organisations. Facilities, such as David Lloyd, provide high-quality facilities but at a price. At the David Lloyd centres, there was not only a charge for membership but also a charge for court hire. Although these provide tennis facilities, they also provide facilities such as
swimming, aerobics, gym and weights rooms, restaurants and bar areas. As the respondent went on to say: “people these days do not want to change in a hut in a field, the bar has been raised on what is available and what people expect.”

6.1.5. Iteration One: Further Areas for Examination

As per the Bryman (2001) diagram the conceptual and theoretical framework needs to be revisited to highlight areas where further research is required from an academic perspective to interpret the data before Iteration Two. Additional theoretical material needs to be added at the stage.

There are three areas which have been highlighted which require further analysis. Specifically these are:

1) the distinction and separation of responsibilities of the organisations into strategic and operations responsibilities
2) The power and politics in sport – as there is no single organisation which owns all the resources then the power and politics in the sport is an important issue
3) The use of mandated versus voluntary systems – the Totaltennis initiative was a voluntary system and it is important to understand why it was unsuccessful in order to propose an ERP framework

These areas are discussed in further detail below:

**Strategy versus Operations**

It was clear from the objectives, open coding and axial coding that a number of organisations did not actually own any resources, i.e. courts for the playing public. There is a simple designation of whether an organisation is operational or strategic and this is whether they own, manage or otherwise have facilities for playing tennis. If they don't they can be classified as strategic, and if they do then they are operational. There are some notable exceptions where the LTA, for instance in its role as the NGB, is strategic, but it does have a small number of courts (the National Centre at Roehampton as an example) which are available, although these are typically for the elite players and therefore the LTA has some operations responsibilities asides from the management of the club membership.

Johnson and Scholes (2002) identified three levels of strategy in a corporate environment. These are:
i) The corporate-level strategy which is concerned with the overall purpose and scope of an organisation.

ii) The second level is at the Business unit level. This is where larger organisations have different business units at either the geographic or industry level.

iii) Lastly, they identified the operational strategy which is concerned with the component parts of an organisation which can effectively deliver the corporate and business unit level strategies in terms of people, resources and processes.

It is the operational strategy which is relevant here because, although there are many organisations involved, they do not all control the people, resources and processes as defined by Johnson and Scholes (2002). In the section on Power and Politics in sport, the issue of the control of resources is discussed as part of the decision-making process. However, in this area it is important to focus on the strategic and operational elements.

It is hard to map the definition of the strategy layers directly onto the organisations identified thus far as they are not part of a single organisation but are independent bodies with unified objectives. It is further complicated as the LTA could be said to incorporate a number of the strategy levels in the one organisation. The LTA is responsible for the corporate strategy for British Tennis. It could also be argued that the LTA work at the business unit level for the government organisations and they also enact the operational strategy.

The most important aspect of the discussion concerning strategy versus operational responsibilities is that the LTA, as the sport’s National Governing Body, is the most senior organisation, i.e. it is recognised by the government organisations and has national responsibility. It is also the most senior organisation to have direct control of resources (resources in this instance includes coaches, control of the tournaments for accreditation and also control of the ratings and rankings systems in use). Organisations under the LTA have smaller units of controls, i.e. the regional LTAs have control of resources in the county and the clubs at the bottom of the chain are responsible for the courts and members within their own clubs. Therefore, although the LTA is identified as the most senior organisation at an operational level, it does not own the resources of the clubs at the lower levels. What it owns is the brand, the NGB accreditation and the national squad. This aspect is important when looking at systems which span multiple organisations. The issue of control and centrality is discussed later in the chapter under the section concerning power and politics in sport.
In summary, it seems likely that the LTA has the accountability to achieve its own and government objectives, but it does not own all the resources, in terms of people and clubs, in order to deliver those objectives. This will be reviewed as data is collected to confirm or review this assessment.

**Power and Politics in Sport**

Given the number of organisations identified to date, it would seem unlikely that the issue of power and politics is a simple one. In the world of organisation theory there is either an overabundance of writing on power, or there is not enough research (Slack, 1997, p184). The common conceptualisation of power is the ability to get someone to do something they would not have done otherwise. This definition seems overly antagonistic and ignores the possibility that power relations may be relations of mutual convenience. In a study on the planning activities of UK rugby clubs (Harris and Jenkins, 2001) there was a comment that “the somewhat negative image of the governing bodies involved in this study highlights the need for direct, frank and dynamic communication between the national governments of sports and the grass-roots level”. Some of the interviews completed in this research did suggest that the larger clubs wanted no assistance from central governing bodies and “pleaded to be left alone”, whilst conversely the smaller clubs appeared to need and welcome guidance from the governing bodies. Harris et al. (2001) summarised by saying that there was an underlying lack of respect for the governing bodies and any direct control is generally unwanted. This aspect may or may not be reflected in the British Tennis structure and it is important to understand the level of interaction that is involved.

The opportunity for strategic alliances to promote the furtherance of British Tennis would seem to be opportune as there are a considerable number of organisations involved. Alliances are formed for many reasons but include current resources and competencies or to explore new possibilities. Johnson and Scholes (2002) identified three major motives for alliances: the need for critical mass; the requirement for co-specialisation; and the opportunity for members to learn from each other. Johnson et al. (2002) went on to identify several reasons why alliances were successful. One important aspect that would also appear to heavily influence other areas is trust. They go on to subdivide trust into two elements, based on competency and character. The example given in the previous paragraph of the issues within Rugby Union would suggest a breakdown of trust, although there is insufficient detail to be able to ascertain whether this was an issue of competency or character. Other elements of successful alliances include senior management support (a key element in successful projects
as well (Bingi et al., 1999); performance expectations; clear goals and organisational arrangements; plus the need to evolve and change.

Slack (1997, p182) identifies five main sources of power within sports organisations or the subunits associated with sports. Specifically these are the acquisition and control of resources, the ability to cope with uncertainty, centrality, non-substitutability, and control over the decision-making process.

**Acquisition and control of resources.** All organisations or subunits within an organisation, or within part of the overall value chain, require a continuous supply of resources in order to sustain their output or value-add. Organisations or individuals which can provide resources that are difficult to obtain, or are critical to the subunit, come to have power in the value chain. These resources come in the form of money, people, information or legitimacy. The first three are reasonably self-evident, but legitimacy is interesting in as much as it enables some organisations to demonstrate or wield a power that their experience, knowledge or funding doesn’t warrant, and that in a free market economy without that endorsement they may not survive. Specifically in this research it is evident that the LTA has legitimacy due to its position as the National Governing Body for the sport, which means that it has government recognition. Additionally, the courses to accredit coaches are run by the LTA, which also emphasises this aspect of legitimacy.

**The Ability to cope with Uncertainty.** Organisations are constantly coping with uncertainty arising out of any number of reasons; from suppliers, government changes or legislation… the list is endless. One of the coping strategies and hence source of power in the sports world is provided by the market research units within various organisations. If they are successful at predicting trends such as product or service demand, then they can become a power unit within the organisation or value chain. Subunits which are able to utilise this information can help to reduce the uncertainty, increase their own standing in the value chain, and also improve their own objectives and targets.

**Centrality.** An organisation’s position in the work or flow of information or resources can help to determine the amount of power that the subunit possesses. The centrality of the LTA is one of the key aspects of the LTA in this investigation. As the National Governing Body it could be argued that the centrality is inherent in this position. It has already been shown that the LTA holds a unique role in the value chain as the sports NGB. Two aspects of
centrality which are relevant are the sport’s own organisation and structure, and how the strategy is planned and organised to allow the flow of information.

**Non-Substitutability.** This is analogous to Porter’s barriers to entry in his five forces model and works in two ways. One is the ability of new people or organisations to be able to enter the market and provide competition. In some instances it would be hard to consider two controlling bodies of a sport, but there are instances where it is hard to discern who is in control. Secondly, non-substitutability can simply be the desire of an organisation as they have knowledge and expertise that is not easily replaced.

**Control over the Decision-Making Process.** This is not about the decision itself but the decision-making process; the various subunits that can heavily influence the timing of decisions; about who is involved in that decision; and, importantly, what alternatives are presented. One example is where the professional administrators of a particular sport have been able to limit the volunteer involvement in the decision-making process, which also helps to strengthen their own position. This control aspect is very important given the number of autonomous organisations identified. Each organisation has control over its own budget and therefore over the allocation and spending of that budget including the IT spend.

### 6.1.6. Iteration Two: Respondent Themes relating to Research Question One

Within Iteration Two the objective was to confirm previously collected data and identify any other insights into the organisations and linkages between them. The data was collected and coded as per Iteration One. The ability to use the same coding classifications also shows that there were no new categories identified from the new data collected and shows that, although there were interesting examples of organisations and systems usage, there were no new major additions to the classifications.

The themes that are pertinent to Iteration Two and Research Question One are listed below.

**Organisations**

**Principal Issues**
From a strategic perspective, Iteration Two confirmed that the linkages between the DCMS, UK Sport and Sport England were all at a strategic or, in the case of Sport England, a funding relationship level. In fact, there was little documented interaction with the DCMS and any other organisation. Three people mentioned that they received emails from them and Respondent Fifty-Eight mentioned that they sent statistics on court utilisation and occupancy. When probed about this, as it was not mentioned by any other respondent, he went on to say that they are given what he described as ‘multipliers’ by the Association for Public Service Excellence and they use these figures to extrapolate the number of tennis players using the facilities and these were then sent on. These figures could only be useful as a guide, as the facility in question did not have the systems or recording capability to know whether the court was used for singles or doubles or indeed to know the age of the players concerned.

All respondents had interaction with their regional LTA at a number of levels, although few had interactions with the LTA central organisation, except where there were specific High Performance Centres (HPCs) or special events such as major tournaments or the Nottingham Tennis Tournament.

From the regional LTA perspective their Development Officers (Respondents Fifty-One, Sixty and Eighteen) had considerable interaction with the clubs but the central LTA system (Siebel) was used primarily as a contact database. Respondent Sixty did say that the tournaments were also registered on the Siebel system but these would only be LTA-registered tournaments and they did not link the tournament invitations to the database.

**Clubs**

**Principal Issues**

There were no new insights into the operations and interactions of clubs. As mentioned previously the smaller clubs used Microsoft Office or equivalent for their systems. This allowed them to maintain their membership details and run their accounts. It is only when the club has a substantially larger membership or, in the case of Respondent Fifty-Three, where they are part of a multisport club, that the use of a membership system is mandated by the group committee. This enables the club to track the membership centrally and can also offer multisport membership details. The respondent did however highlight the issue of volunteers managing the system: they had had to wait for a long time for their data to be entered on to the central system as they could only ask and try to influence the volunteer concerned, as opposed
to be able to have direct control over activities as would be the case in a commercial organisation.

None of the clubs interviewed in Iteration Two had online booking facilities, although two mentioned that they were investigating options for this.

**Non-Clubs**

*Principal Issues*

Under the non-clubs category are the council and commercial operations where tennis is offered outside of the private club environment. One of the important aspects to emerge was the number of councils that do not charge for access to their tennis courts. These are local park facilities where it is not commercially viable to charge as the cost of collection is greater than the revenue gathered. This was referenced by Respondent Six, and council organisations (Respondents Thirty, Thirty-Two, Thirty-Three and Thirty-Six) all later confirmed this. One council had a two-tier system of tennis courts. In the lower tier they did not charge for court usage and the courts were of a lower standard, e.g. they were all of the same colour and low-grade surfacing. The upper tier courts were two colour\(^6\) and of generally better maintenance. The upper tier courts were chargeable. None of the free courts, by any of the councils that responded, was bookable and therefore there is no information captured as to their usage. This would also infer that the occupancy is not recorded. The courts in question are all tarmac and the respondent said that they would also like to have grass courts but that they were worried about possible litigation due to the more slippery nature of the surface.

Where council provision was not free the respondents fell into two groups: those that provided council facilities that were operated and run by the council (described by Respondent Sixty-Three as a unitary authority), and those that were contracted out either to a specialist company such as DC Leisure and Leisure Connections, or to a charitable trust such as Welwyn Hatfield Leisure Ltd and Islington Tennis Centre. Although the companies have different governance structures and profit objectives (commercial versus not-for-profit) they both service the leisure facilities on behalf of the local council. From a systems perspective they run very similar operations. Two councils operate a leisure card that covers a number of different facilities within the area or city (Respondents Forty-Nine and Fifty-Seven). This enabled

\[^6\] The outside of the court is a different colour to the inside of the lines. This makes it easier to see if the ball is in or out but does not affect the surface of the court. It is just different colour paint.
discounted facilities to be booked and the councils concerned were then able to track at least the name of the person making the booking. They would not know whether the court was occupied by two or four players or who those players were. Respondent Forty-Nine was also unable to say how many tennis members there were at his facility as the leisure card covers the council-run facilities and is not sport-specific.

The important aspect of the council-provisioned facilities (either owned or contracted out) was that the systems they used were remarkably similar to the operations of similar-sized commercial or private organisations. One system (Gladstone Health and Leisure Systems) is used by more than one council (Nottingham, St Albans, Newtownabbey, Sheffield) and leisure providers such as GLL.

**Coaching**

Iteration Two did not elicit any new information about coaching within the clubs and non-clubs operational environment.

** Competitions and Tournaments**

**Principal Issues**

For the most part clubs, council and commercial organisations that ran competitions and tournaments did not use tournament specific software, although the larger clubs and organisations that did use a system called Tournament Tennis Planner. This is a specialised niche software development which is promoted by the LTA for the management and organisation of tournaments. However, this is only relevant for the larger entry tournaments as opposed to the smaller events where the entry is smaller. This software is not free, although LTA has a discounted price for LTA members, notwithstanding the reduction of price. It was not in common use across the respondents.

6.1.7. Issues Summary

The two iterations raised a number of issues that are to be addressed by the research. The issues for Research Question One and Research Question Two have been uniquely referenced and these references are then used in the subsequent chapters to discuss the issue in
more detail and provide a summary of how these issues have been addressed on page 190. In summary the principal issues highlighted are:

- **RQ1a** The tournament and rating and rankings updates are not real-time and there can be several months between updates in the instance of the rankings system.
- **RQ1b** There is a large majority of the LTA members in affiliated clubs who are not known to the LTA.
- **RQ1c** There is a large majority of the non-club players who are not known to the LTA, i.e. those people who play on council courts.
- **RQ1d** A number of local councils provide courts which have no attendants on site and therefore people can just turn up and play. There is no booking facility, either chargeable or not, and therefore the local council do not know their usage from capacity perspective or the identities of the people playing.
- **RQ1e** The councils do not know if the court is occupied by two or four players.
- **RQ1f** There is no consistent recording of player information by the local councils and again they do not know who is using the courts.
- **RQ1g** There is no central decision-making process.
- **RQ1h** There is no central coaching-support system.
- **RQ1i** There are a considerable number and diversity of organisations involved in the provision and support of British Tennis.
- **RQ1j** There are organisations that have a strategic role and organisations that have an operational role; the LTA links these two different positions in as much as it has both strategic and operation responsibilities.

These issues are discussed in the next section and are also addressed by subsequent discussions concerning Research Question Two and Research Question Three.

### 6.1.8. Research Question One Discussion

*What are the objectives of the organisations identified in the provision of British Tennis and what are the linkages between them?*

The discussion concerning Research Question One is structured around the headings from Chapter Four concerning the value chain and value networks. This is to provide a link back to the theory and how it is applied to the data. The additional theory concerning strategy and operations is included also in this section.
As described in Chapter Five on research design, in order to analyse the linkages it is important to document the organisations or entities involved in the network, identify a first categorisation to see their role in the network, and then to research their relation to other entities. The previous chapter looked at the data using the open coding method, and it also looked in detail at the relationships using the axial code method. This analysis will now link the value chain and network theory and the data collected in order to reach a number of conclusions.

6.1.9. Updated Value Chain Model

Having reviewed the organisations earlier in the chapter, it is now possible to populate the value chain. The new diagram is presented in Figure 14 on page 139. This diagram is built using from the Pitta and Laric (2004) model (Figure 13) which focuses on the American health care system. What is important about this model as a basis for building the value chain for British Tennis is that it covers a wide range of organisations, both government and commercial, profit and non-profit, manufacturers and sales organisations, plus the end users in the form of the patients.

![Figure 13: Health Care Value Chain (Pitta and Laric, 2004)](image)

This model breaks down the organisations into a manageable framework and denotes the principle transactions or interactions between them. It does not denote the size or the number of the organisations as this would be too confusing for the casual viewer and not
relevant for the purpose of the value chain. The important aspect is the connections between them, not the relative size of the organisations.

Figure 14: Value Network for British Tennis based on the Pitta and Laric (2004) Model

The modified version of the Pitta and Laric model (Figure 14) takes the theory and develops it further to highlight specific aspects of the interactions. As identified previously, the operational versus strategic is able to be shown graphically here and this allows the role of the LTA to be highlighted. The LTA have the pivotal role distinguished between the two genres in their role of National Governing Body.

The groupings follow the modified Game Plan (National Strategy Unit, 2002) table as described previously. This diagram shows the central role of the LTA, in its capacity as the National Governing Body, and it also shows the links to the regional LTA, from which the regional body has communication with clubs, councils etc. The role of the LTA and, to a lesser extent, the role of regional LTA are pivotal in the discussion. As highlighted in the previous chapter concerning operations versus strategy on page 129, Johnson and Scholes (2002)
identified three levels of organisation or subunits. The diagram shows the central role of the LTA as being responsible for strategy and operational aspects. This equates to the role of Business Unit as identified by Johnson and Scholes (2002). What this means in practice is that they are an autonomous unit and are privately funded but have strategic links to the DCMS as an example, but will also create their own objectives. More importantly, they have operational functionality which is shown by the management and organisation of the regional LTA, major tournaments and elite players. This also is shown in an IT systems perspective, whereby they collate and publish the ratings and rankings of the UK-registered players.

Although this is complicated, it is probably less so than has been the case in history. The creation of UK Sport and Sport England has helped to rationalise down the number of government organisations involved, although some of the “legacy” organisations still exist, albeit in a greatly reduced role and set of responsibilities, e.g. the Central Council of Physical Recreation. This large number of organisations still means that there is a large number of linkages, and more importantly there is no one group with overall control of any of the other groups, although there are some very strong links and a significant number concerned with funding.

What is not well represented in this diagram is the number of organisations in each “bubble”, as in the original Pitta and Laric model (2004). In the case of the bubble for LTA-affiliated private clubs, as an example, this represents 2,600 different organisations.

Additionally, although the diagram shows neatly discrete entities, some people may appear in more than one area. For instance it is quite common for the high-performance tennis players to also be coaches.

In summary, the populated diagram with the additional linkages and the categorisation of the relevant organisational bodies highlights and differentiates the strategic versus the operational roles that the various organisations have in the provision of tennis, and graphically demonstrates the central role of the LTA in the organisational chart.

**Value Chains in a Service Environment.**

As mentioned before the value chain under discussion is not a product-based system, but is based on service-related activities; it therefore presents different objectives to those of the traditional model.
At the top of the organisational chart are the strategic bodies which are government-based and they are mostly directed at high-level strategic direction and funding. The Game Plan (National Strategy Unit, 2002) was the most up-to-date strategy document, and this has had a couple of revisions and reviews but is now getting to the end of its useful life, according to anecdotal evidence from a senior figure involved in sports administration. Certainly, the objectives it strives to achieve (improving the quality of sport with in the UK; more British competitors involved in international “mega events”; increasing the number of people playing at grassroots level; and improving the health of the nation) are reiterated across a number of bodies. From a systems perspective, however, this kind of strategic direction and funding agreement interaction are not easily tracked via the use of information systems. In Davenport and Rao’s ERP module listing in Table 2, the main systems listed are operational transaction-based systems, and the closest functional area that would approach the kind of financial management is in the budgeting module. Again, the main benefits of this are the integration with other operational modules (Accounts Payable, Accounts Receivables, General Ledger etc) and the tangible and intangible benefits of trying to integrate the government systems across all the National Governing Bodies for sport; all the associated bodies would not offsite the costs even if it were possible.

One of the key elements of the service chain is the issue of tournament results and individual ratings. As mentioned previously, the ratings are updated every six months. A centralised integrated system or a framework that allows compatibility with a central system would allow this excessive lead time to be reduced dramatically. The national rankings are updated every two weeks and this frequency is likely to be because the number of amendments or new tournament entries is considerably lower than the ratings systems, which support all levels of players, from virtual beginners to higher county standard and above.

As identified in the previous section, the hub of British Tennis is the LTA, which drives policy for British Tennis, develops new initiatives that are rolled out to the regions and the clubs, plus provides funding. It also takes direct responsibility for the development of elite players (Respondent Twenty-Two). And the LTA has developed a number of systems initiatives which are then provided to the regional LTA and the clubs. The principal two examples of this are the central Siebel system and the Totaltennis website. The Siebel system has been developed to provide a CRM-based facility for the central LTA and for the regional LTA. However, this does not appear to be used to its full potential for the development of
CRM-based initiatives. The Siebel-based product is an expensive product in its own right that requires expensive resource to maintain and develop; however it can support marketing campaigns and segmentations of several million entities. The comment from the county-based representatives was that the Siebel system was being used as an extended telephone directory and was still being developed, although the benefits of the system were outlined in the LTA Annual Report in 2006. Unofficial comments suggest that the whole strategy for this area is under review, but there has been no official statement to support this.

Further down the value chain the regional LTAs are in an interesting position from an organisation and structural perspective. They have some full-time employees, who are either funded by the LTA or by the local organisations, but they also have a committee made up of volunteers, and from a systems perspective can act in a quasi-autonomous fashion. Using the Johnson and Scholes framework the regional LTAs are synonymous with the operational units. They have their own independent budget but they are funded by the central LTA. They have independence on some systems that they can use but not on others. As an example: one regional LTA unit runs two websites – one within Totaltennis and one as an independent entity which is developed and maintained outside of the central LTA.

Using a more detailed view of Porter’s Value Chain and Network (Porter, 1985) to illustrate some of the problems associated with the current information flow highlights a number of links in the chain and the possible issues associated with them.
Figure 15 shows a linkage diagram between three organisations that are principally involved in tournaments organised by the LTA. The sales and marketing effort involved would naturally filter to the regional LTA for onward distribution to the clubs. The clubs have direct contact with the members, some of whom may also be competitors, or potential competitors, for a specific tournament. As highlighted in Chapter Five, the LTA does not know who the tennis players are apart from a small number of elite players (as highlighted in the connector from the LTA to players). Therefore, sales and marketing for these events, such as County Week, must go via the regional LTA. Equally, the regional LTA still does not know who the members are and they have to onward market to the clubs. This highlights a major issue within the club environment, as they have neither the function, inclination nor capacity to market LTA events. They are not-for-profit organisations largely staffed by volunteers, and they have no formal sales and marketing function in which to onward distribute the LTA communications. As identified in the section on Power and Politics in Sport, the LTA do not have control over the
decision-making process at the lower levels, and they cannot make clubs advertise or promote the central tournament or feature. The clubs, for their part (assuming the information gets to the right person), have no incentive to advertise or promote anything as they will not make any money from the effort. If they were to do it at all it would be out of goodwill.

Chapter Four discussed the concept of a value ecology moving from a firm’s individual strategy to thinking about the value ecology as a whole. The example of the inter-linkage of the value chain of the marketing and publication of a tournament is a good example where there is no value added as it moves down the linkages. Prahalad and Ramaswamy (2004) put forward the concept of co-creators of value through personalised interactions which are meaningful and sensitive to a customer. The example given does not add value at any stage and value is often destroyed as the information is not passed on or it is passed on indiscriminately. What Prahalad and Ramaswamy are putting forward is the ability to be able to ensure that right information gets to the right person in a way that is sensitive and appropriate, and not a simple ‘sheep dip cascade’ of information. This method does require that there is accurate and correct information about the consumer that is up to date. The Burn and Ash model shown in Figure 9 on page 64 indicates the path that might be taken to get to a value proposition that can leverage the information; this is shown as stage 3 of the model. Currently the LTA, with its existing information and lack of integration with the other organisations, would be between stage 1 and stage 2. The goal is to create a “seamless” – or virtual – organisation as proposed by Palmer (1996) in which external organisations become operationally indistinguishable from internal relationships. Palmer was describing a commercially based model and so the model for the tennis organisations should be a lot more practicable as ostensibly all the organisations have the same objective: to promote tennis to improve both the standard and numbers of people playing. Currently the data collected does not suggest an integrated approach.

The LTA must start to disintermediate its marketing, and to communicate directly with the tennis player and viewing public, using a central framework so that value is not lost.

**Scale-Free Networks**

One of the aspects of scale-free networks is the use of the clustering or hubs in the provision of tennis. This can be seen in a number of areas. In the first instance, the chairman of a large private club (Respondent Three) commented that they had created a hub for themselves within the local tennis community and ran a number of local courts, as well as the local courts
on behalf of the council. This is effective, not only in terms of provision of services, but also in terms of economies of scale. The central club has invested time and money in creating an organisation that can provide people to help and assist with the running of the smaller facilities, e.g. providing coaching. And importantly, from the perspective of this research, they are able to provide the access to their central systems to a greater number of people. This would include provision of online booking systems and the capability to check or change membership details, payments for direct debits etc.

Another important delegated hub is the role of the regional LTA staff and organisation. They are pivotal in the management of tennis within a region and play a significant coordination role. This includes a number of aspects:

- Coordination with the local council for provision of coaches and facilities
- Coordination with clubs over local leagues, competitions, LTA initiatives, funding etc
- Coordination with the LTA for new initiatives, funding guidelines, strategic direction, management of elite players, inter-county competitions, etc

As per the Game Plan model the LTA delegates a number of responsibilities to the regional arms (County LTA) and they become the delivery arm of the LTA (Respondent Six).

From an educational perspective the PESSCL initiative uses a similar hub model in the provision of tennis in the Local Education Authority. Basically the local central school, typically a larger secondary school, will provide facilities and coaching to the local hub junior schools (Respondent Twenty-One). They will then use the links with local clubs for coaching sessions. This arrangement is also very beneficial for the clubs as it introduces people to the club and the coach, and this allows potential new members to already know someone at the club, which can be an important barrier to overcome.

The literature also identified the concept of a point of origin or a hierarchical parent. From an operational perspective the LTA has been identified as the point of origin (see Figure 14). In the original paper (Shulver and Lewis, 2003) it was highlighted that this point of origin can both create value through guidance and implementation of appropriate performance measures, and also destroy value by excessive bureaucratic overheads or by giving misguided advice. The idea of the LTA as central hub or point of origin is inherent in its role as the NGB. This gives it accountability and responsibility as mandated by the central governing bodies. The LTA’s own grassroots review (SMC Consultants, 2007) highlighted the broad brush
tendency towards initiatives, and certainly at the club level the Clubmark initiative has been seen as more bureaucracy, which endorses the view concerning destroying value.

**Power and Politics in Sport**

In the previous chapter, one of the additional areas highlighted was the power and politics in sport. Specifically these are the acquisition and control of resources, the ability to cope with uncertainty, centrality, non-substitutability and control over the decision-making process.

Two of these five areas are shown to be very relevant for the purposes of this research. They are the issues of centrality, and of control over the decision-making process.

**Centrality:** Slack (1997, p56) identified that the organisation’s position in the work or flow of information or resources can determine the amount of power that the subunit possesses. The flow of information from a strategic and operational aspect is highlighted in Figure 14 on page 139. As discussed previously this shows that the LTA holds this position of centrality, acting as a conduit for strategic elements from organisations higher up in the hierarchy and also the operational aspects via the regional LTA and clubs further down the hierarchy. This centrality is what would be expected by the role of the LTA as the National Governing Body (NGB) and is therefore confirmed by the linkages highlighted. Whilst the role of centrality is confirmed it does not bring with it ownership of resources or assets in the downstream organisations and therefore the last item in Slack’s list, control over the decision-making process, becomes very important.

**Control over the Decision-Making Process:** As highlighted in the previous chapter, the LTA does not have control over the resources further down the hierarchy as to how the budget is spent on items such as IT, and also the LTA does not have control over what the decision-making process is within that budget spend. It cannot dictate how clubs or councils run their membership systems, for instance, and therefore it can only, at best, influence any organisations. This may be very strong influence given its position of centrality as NGB, but ultimately it is still only a position of influence.

The importance of this control of budget and decision-making process cannot be understated. There are two reasons for this: Firstly, this would be one of the key aspects as to why Totaltennis has now been abandoned for clubs but is still being used by the regional LTA.
The LTA could not dictate to clubs to use the Totaltennis website and, at best, achieved 50% usage by clubs, although even within the 50% it is unclear how many of the facilities were used. The ease of use and effectiveness aspects would be important in the take-up of the system, which were highlighted in the discussion over mandated and voluntary systems and referenced as an issue by two of the respondents. Totaltennis was offered as part of the subscription package for clubs and therefore there incurred no additional charge. Even this wasn’t enough to influence clubs to increase the take-up. Where it is still in use is where the LTA has direct control, i.e. with the regional LTAs, where the LTA can dictate what systems will be provided and used. This is the first of Slack’s tenets, which is specifically the acquisition and control of resources.

Secondly, the control over the decision-making process is the ability of the LTA to implement an ERP framework. The lessons learnt from Totaltennis suggest that price is not an issue. In commercial organisations the issue of cost versus benefit is one of the key decision points in any purchase. If, as in this instance, it appears that the system was offered effectively free but was still not accepted by half the organisations, then there must have been some serious issues. Clubs would not accept a system for which there was no additional cost because of three possible reasons: they already had a facility which they had developed or were developing and they would not convert to a new website facility; the functionality wasn’t needed, or it didn’t meet their requirements; or it simply wasn’t very good, i.e. the ease of use and effectiveness were not sufficient to influence the clubs to take up the offer.

The implications of this for an implementation of an ERP framework are important. A framework must offer a cost-effective solution with functionality, ease of use and effectiveness that meet the user requirements. The central body, the LTA, can only request and influence the use of a system, i.e. it cannot be mandated and will only be taken up voluntarily by organisations. Therefore the offering must be one that is overwhelmingly attractive to potential users, the benefits of which would be significant enough to want them convert to the new system.

6.1.10. Summary

This first section of the chapter, pertaining to Research Question One, reviewed the overall goals of the main organisations, reviewed the data from the semi-structured interviews, and discussed them using the themes identified from the content analysis statistics and also via the axial coding analysis via the value chain linkage structure.
This section identifies the varied objectives and organisational structure of the organisations under review. This varies from government strategic enactment, sports excellence and funding, through to the National Governing Body and then to the operational organisations who provide the courts for people to play on. It shows a picture of varied size of organisation, ownership and funding.

The value chain looks at how these organisations interact with each other. It shows no clear lines of communication; no clear ownership; and no clear pattern or overall control of the data involved.

Moving on to the open coding section a number of issues were raised about the current environment. This included the aspect of no central ownership or control; the lack of integration across the landscape; no appreciable central database; the sheer number of players not known to the LTA or any other organisation involved of which a large percentage are not in clubs; no central membership or players information; and no common financial reporting across the clubs. This section also identified the strategic versus operational aspects of the organisations, plus the power and politics involved. This showed the requirement for additional literature to be reviewed which is included prior to the further research of Iteration Two.

In the discussion (section 6.1.8) the value chain model based on the Pitta and Laric (2004) model is revised for the British Tennis environment. This is then reviewed against the aspects of the value chain in a service environment, and a service chain example is given which demonstrates the transactional nature of the environment. The extension of the value chain is then reviewed as part of the scale-free network discussion plus the further discussion concerning power and politics.

Overall this section highlights the organisational complexity, the number and size of organisations, the organisational communications issues and the overall lack of a single point of control, but it does bring into focus what the issues are which an ERP system could address.
6.2. Research Question Two

6.2.1. Iteration One: Respondent Themes relating to Research Question Two

Research Question Two: What are the principal software systems currently in use by the organisations and how effectively are they used in terms of system and information quality? This research question investigates the existing systems in use. It has been shown that there is no single body dictating purchasing across these organisations, and there is complete autonomy within the organisations concerning purchasing decisions. This means that the systems have no conformity of usage.

As before, the structure of this section is from the coding analysis perspective and discusses the IT systems and the associated software and the websites in use.

IT Systems

Principal Issues

The use of systems by the various organisations varies enormously. At the lower end of the scale within clubs, there is hardly any IT used. Respondent Seventeen confirmed this point concerning the club where he played, as it was run by one of the senior members of the club who was not computer-literate. At the other end of the scale one of the larger clubs commented that they believed they had one of the most sophisticated systems and they were looking to sell this to other clubs.

One aspect of the autonomy of the organisations involved in the research is the fact that systems are not mandated. The LTA provides a number of systems that regional LTAs and clubs could use, especially in the form of Totaltennis and it (the LTA) has recently installed a Siebel CRM system which allows a far greater volume of information to be held and used. From a regional perspective, however, certainly one regional LTA organisation had invested in its own website and its own “county database”. The use of central systems from a county perspective is not consistent. One county invested in local developments which, as suggested above, overlap considerably with some of the goals and ambitions of the central LTA systems. This leads to duplication in some areas or, with other counties, waiting for functionality from the LTA.
One of the issues raised by Respondent Twenty-Four was the sheer number and diversity of clubs and requirements. She commented that the company had existed for approximately eight years developing software for the club market and that “we are still finding new ways in which clubs operate”. This variety and diversity in requirements would partially explain the low take-up in the Totaltennis website initiative. This is discussed further in the section on websites later in this chapter.

Although the update of new technology and systems was not particularly prevalent in the research, one area that was mentioned by more than one respondent was the use of SMS texting. This was seen as a benefit in terms of its speed with communicating with the users; the immediacy and access was different than the facility given by email. However, although the coverage was good compared with email, it has drawbacks on the length and complexity of the message able to be delivered. There was a concern voiced by one respondent that it was not suitable for events that were a long while ahead and it was more suited to instant messages about changes for a match that evening, for instance.

The use of email across the respondents varied. Respondent Seventeen said that they should – but don’t – email the newsletter. Other respondents mentioned that they found it useful, but again the issue of nominating a person or volunteer to take on the responsibility was mentioned. The LTA Totaltennis facility provided a basic email contact management system, but it was difficult to maintain and did not provide error information concerning receipts, bounces and failed sends (Respondent Fourteen).

The membership systems which are run to support the administration of the clubs vary enormously. At the manual end of the scale is one club (Respondent Seventeen) who said that their membership secretary had a book which they maintained and didn’t even use a PC. Most of the middle-size clubs seemed to manage with a spreadsheet or access database which they maintained. The idea of categorising clubs and the software used is discussed later on in this chapter. Respondent Fourteen commented that they had a “massive” Excel spreadsheet which they used to run the club. The larger clubs – with membership of 1000 members plus (Respondent Three and Twenty) – were definitely of the view they could not manage the club membership without an IT system. At this level the requirement for accurate and timely management of subscriptions is important to maintain the revenue required to run what is a small business. The system would also encompass other aspects of the membership
maintenance such as financial accounting and the financial obligations such as tax and VAT, depending on the club’s status.

As an example, there is a large club in the South East which has gone through a period of major expansion and now provides a facility with 16 courts (2 indoor, 8 grass, 2 floodlit acrylic, 3 artificial grass and 1 tarmac, 3 badminton courts and 3 squash courts as well as an indoor function/aerobics room and bar and restaurant. The club now has 1,700 members and revenue in excess of £750k per annum. Importantly, it is also profitable and growing. The club is effectively a commercial organisation and therefore needs commercial and robust systems to support it. The documentation, obtained by the research, included a case study analysis with a section on computerisation. With membership of that size the capacity to manage the membership and fees manually would not be practical, so they commissioned a membership system to be written. This also allowed them to collect membership in the month that people joined, which then became the renewal point. Typically clubs will pro-rata the subscription if the members do not join at the beginning of the tennis year in April. This monthly collection method allows a more even revenue collection over the year and a reduced administrative overhead and peak. From their literature and a site visit the computerisation has increased to include:

- Membership details (name, address, DOB, date of joining)
- Subscriptions (any type, combinations, discounts)
- Direct debit
- Court bookings (this is touch-screen technology and allows members to book for themselves)
- Coaching programmes
- Accounts
- EPOS (they have a club shop which sells clothes, racquets, balls, etc)
- Internet booking to allow remote access to the booking system
- Entry control systems

**Other Issues**

The LTA is going through a major reorganisation which means that, from an organisational structural perspective, there is a new management team that has only just been appointed and is therefore formulating its own strategy and priorities. This has caused other aspects of the LTA service to be disrupted. For instance, Respondent Ten was unable to talk
about any system-wide marketing initiatives as they were being provided by the LTA and they were on hold until the end of the summer.

**Website**

**Principal Issues**

There are three principal aspects concerning websites from the available data. Firstly, there is the LTA-provided facility, where the NGB provides information that is relevant to them. Secondly, there is the website facility provided free by the LTA for the clubs under the Totaltennis.net framework. The third aspect of website ownership is the websites that are wholly owned and developed by the clubs themselves. These three aspects are discussed in order below.

Firstly, the central website provides an information service which incorporates news as well as a search facility to find clubs, ratings and rankings, plus player profiles and contact information. This is well established and provides a lot of valuable information.

Secondly, the websites for clubs to sign up and maintain their own web facility: www.Totaltennis.net. This has not had a 100% take-up from clubs and the suggestion is that only about 50% of clubs have used it. This position is made worse as it is not being supported and has a number of errors where links do not work or information is out of date. They apologise for the inconvenience, but they say that the service will not be fully functional for a couple of months, although the dates are not specific. This has been subsequently discontinued for clubs.

The third component was the websites provided by clubs themselves. Clubs funding their own sites have the flexibility to promote their club in a way and manner that they want to, and the ability to use their own design, logos and colour scheme as they see fit, with no constraints. This would either need to be provided by a professional organisation at a cost, or by a club volunteer. For the big clubs, being able to manage their own websites would be important to them (Respondent Three and Twenty) as they are effectively a business and need to promote that business in the best possible way.

Whether the website is provided by the LTA under Totaltennis or it is owned by the club, the issue of keeping it up to date is one of the most important aspects of any website.
Respondent Seventeen commented that the website facility was poor. On probing, this is because the club’s existing website was not being maintained and updated and therefore was not promoting the club in its best light. This brings in the aspect of volunteers as mentioned previously. Respondent Fourteen also commented that the Totaltennis website administration was difficult to remember and navigate as it was not intuitive. From his perspective as an infrequent user he found it hard to remember the navigation and this made the experience more frustrating.

**Conclusions**

From a systems perspective, there are shown to be a number of deficiencies and gaps in the existing use of systems. There is no standard set of software in use and no single system which gives common usage. There is no single system in use and the attempt by the LTA to implement a facility giving clubs a website (the Totaltennis initiative) has been unsuccessful. This has been due to a lack of understanding of the clubs’ requirements, the difficulty of usage, and the clubs’ own independence.

**6.2.2. Iteration One: Further Areas for Examination**

In the same way that for Research Question One there were additional areas for examination of strategy versus operations etc, so for this research question the area that requires further investigation is the subject of mandated versus voluntary systems.

**Mandated versus Voluntary Systems.**

Specifically for the purposes of this study the implications of mandatory versus voluntary systems can be applied to the apparent failure of the Totaltennis web initiative. There were comments from the interviewees (as referenced above) about the difficulty in using the system and that it was not intuitive. This lack of ease of use would reduce the inclination for use as it is not a mandatory system. The clubs can choose whether to use the system or not, therefore this would cause the system to be less effective. Ease of use and effectiveness, are shown in Figure 16, are two key aspects in the adoption and use of new IT and ERP systems. If either of these two metrics scores poorly in the users’ rating of the system then this will have a significant impact on the overall success of the system. The other aspect which is specific to websites is that they need to be up to date or they will fall in to disuse. Whereas with internal systems if they fall into disuse or are not kept up to date then it may
only be internal staff or volunteers who are aware, but with public-facing websites this lack of maintenance is very visible and publically viewable.

DeLone and McLean (2003) also made comments about some of their qualitative findings from the study which are relevant to the Totaltennis discussion. They felt that the system implementation was perceived to be the harbinger of power balance changes. In other words, the system implementation into the subsidiaries was felt to be the start of a greater control from a central operation and a reduction of autonomy of the specific subsidiaries. This “disempowerment” would also cause a subsequent loss of motivation in some areas if the other acceptance factors were not sufficient to offset the loss of control, i.e. if the system was quicker, easier to use and more effective then they would be able to enhance the other extrinsic motivators such as improved job performance, pay or promotions. Where this is relevant is that it is analogous to the LTA implementation, that is the use of a central system was felt to be the start of greater control from a central operation and therefore a reduction of autonomy. This will need to be addressed as part of the implementation considerations discussed later in the thesis.

The question of mandated systems with respect to motivation is an interesting aspect of the systems implementation. With an IT system that is mandated from any level, there is very little discussion about localisation outside of legal and fiscal constraints, and even these are likely to be built into the system by the vendor and have standard custom and practice. Brown
et al. contend then that the motivation aspects for the staff affected by an integrated systems implementation has a different rationale, as opposed to systems that are implemented, which they call volitional (Brown et al., 2002).

Brown et al. (2002) says: “In the case of a broad scope system or application, we propose that employees do not have a decision regarding use. In these types of mandated situations, the system must be used to complete one’s own job tasks that are also tightly integrated with the tasks of multiple job performers. … “working around” the technology is not an option.”

This then leads to the conclusion that “A user’s only freedom of choice, assuming that he or she does not wish to leave the organisation, is how wholeheartedly to accept the innovation.” This also leads on to other studies (Brown et al., 2002) referenced organisations that have demonstrated that employees will use a technology to perform (and keep) their jobs, but they may also engage in alternative destructive behaviours that may or may not be intentional.

Brown et al. concluded that ease of use and effectiveness of the system were both key in the acceptance of the system under mandatory conditions. However, they do point out that their own research was concerned with one company in one industry and the model would therefore need to be validated in other industry sectors.

6.2.3. Iteration Two: Respondent Themes relating to Research Question

Two

IT systems

Principal Issues

The IT systems in use varied across the sample, although there was one system (Gladstone) which was in use by two independent organisations in the research (Respondents Fifty-Seven, Fifty-Eight). Where the organisation used a system, such as Gladstone, the level of integration was high, as the package is an integrated design as one would expect. Respondent Fifty-Seven, who was responsible for the contract for the council-outsourced leisure provision, made the point that the council had included in the tendering process that the
systems used must be integrated. This would demonstrate a longer term view of how the
council views the importance of the use of information within its contracted organisation. This
also included the financials module as part of the integrated package. Where this package was
used the data and systems quality was perceived to be good and the integration of the data a
significant benefit to its use.

One council (Respondent Fifty-Eight) took a more considered approach to integration
and, although they used the Gladstone system (referenced above), they deliberately separated
the financial systems from any other system. The respondent did not know the specific reason
why this was stipulated although security and audit requirements would seem to be the most
likely requirements. Respondent Fifty-Three commented that integrated systems were only as
good as the data entered. This does highlight a strength and weakness of an integrated system.
Data only needs to be entered once on the system and it is available to all. However, if that
data is wrong then it is incorrect for all the modules.

With regards online booking systems there was no consistent approach to usage or
requirements. Where respondents (Respondent Fifty-Seven as an example) had an integrated
system, such as Gladstone, then online booking was available and was being used. Other
respondents did not use a system and just have customers ringing in to book (Respondent
Fifty) or deliberately did not have the facility as they had more capacity than members and as
such did not need a booking system (Respondent Thirty-One). Respondent Fifty-Four made
the point that they were the first leisure company to be able to offer online booking and that
this had been available for a number of years.

When prompted, respondents generally considered the overall systems and data quality
to be adequate or, in a number of cases, poor. Respondent Sixty-Five commented their data
was not up to date as it is being input by the team that manages the multi-sports facility that
they are part of. The issue of data being input or managed by volunteers was referenced by
other respondents and the subject of volunteers has been raised in several other parts of the
dissertation. Data quality may be down to simple timeliness or accuracy of the data input or it
may down to the software storing or calculating the data incorrectly.

None of the respondents used the information for targeted marketing, i.e. being able to
target specific events to specific target markets.
Websites

Principal Issues

The Totaltennis initiative was not used by any of the clubs interviewed in Iteration Two. This is to be expected as it is being phased out by the LTA although there has been no replacement announced as of the time of writing. The LTA regional CDO confirmed that they were still used by the county organisations, but they did not know if this was a temporary or permanent facility (Respondent Fifty-One). One CDO (Respondent Fifteen) did say that they also maintain their own website in addition to the regional LTA Totaltennis website as this offered them more flexibility and control in what they were able to display and how they could publicise information.

The use of the website is one of the areas for discussion concerning the use of mandated versus voluntary systems. The Totaltennis website was not mandated by the LTA as they do not have the authority to dictate to clubs what they should use as a website. However, once the clubs has decided on the use of the Totaltennis website then the website does effectively become a mandated system as the user and support people do not have any choice. The site was offered free and had the basic features that the LTA decided to include in the package. As discussed in the previous section the two elements that were important in the discussion concerning mandated and voluntary systems were in the DeLone and McLean model of Information System Success (DeLone and McLean, 1992). Specifically, there were two elements which were “intention to use/use” and “user satisfaction” that are key to the use of voluntary systems. The respondents in Iteration One did not find the site easy to use and said it was not intuitive, i.e. it was hard to remember where the links to certain functions were, and when the site was revisited it was not easy to find them again. This lack of ease of use would also lead to a reduction of effectiveness of a website (criterion 2 from Brown (2002)): if the data and information is not easy to keep up to date then the site will be used less and become ineffective.

The other element of the Totaltennis usage is that in almost all cases it would be maintained by volunteers with no training in web design or systems maintenance. It is not clear what the content management system (CMS) used was, but even the simplest CMS system requires basic knowledge of how a website is put together. Without technical knowledge it would be difficult to understand the technical aspects of creating web pages and
this would mean that it was not easy to use, which is one of the DeLone and McLean (2003) success model criteria, and is therefore likely to have fallen into disuse and become ineffective. None of the Iteration Two respondents used Totaltennis and at least one person had never heard of it.

6.2.4. Issues Summary

Iteration Two confirmed the varied use of systems across the piece and again reiterated the no single point of control in the value chain as regards IT systems and websites. It showed the use of integration where organisations had taken advantage of this and there were two notable points raised. The first point was the council which included integration as part of its bid process and that the systems had to include this aspect in their tender proposal for leisure services. The second point to be raised is the council that deliberately wanted to separate the financial systems from the frontline operational systems. This is very unusual as a requirement and has not been identified by any other respondent. Unfortunately, the thinking behind this decision is not available and it can only be presumed that this is to do with audit and security. Modern database systems have extensive database security and it is only typically found in high-security environments where segregation of a systems nature like this is found.

The specific issues that were raised, in summary form, are:

- **RQ2a** No single software system is use and little commonality of systems – no integration of data
- **RQ2b** Central reporting of information is difficult and time consuming to produce
- **RQ2c** Mandatory versus voluntary usage of software
- **RQ2d** Diversity of requirements in system usage
- **RQ2e** Quality of data input
- **RQ2f** The use of volunteers to run and input data
- **RQ2g** The take-up and failure of total tennis initiative
- **RQ2h** No targeted marketing

These points are discussed further in the next section and in the discussion concerning Research Question Three.
6.2.5. Research Question Two Discussion

In the previous chapter the review showed considerable diversity of systems across the range of sizes of clubs. Apart from the Totaltennis website there is no other system that is in common use across the spectrum of clubs and other organisations. Even with the website there is not full take-up and it has now been discontinued, even though this is a free resource which is hosted and maintained (from a code not data perspective) by the LTA. This section seeks to understand the IT landscape using the theory identified in Chapter Three.

As this section of the thesis concerns the software in use, the structure used is based on the listing as identified in Chapter 3.1.3, which discussed the module listing structure for ERP systems. The first section, however, does vary from this format as it discusses a high-level view of the systems in use and the categorisation of the IT systems by the various organisations.

Systems Categorisation

Although Chapter Three discussed the ERP categories, the data analysis also identified another level of usage below the ERP system and other package usage aspects that are important to recognise. If one were to draw a continuum of systems usage in the area then at one end you might have the high-end ERP system as sold by SAP and Oracle as two of the major ERP software vendors. At other end of the continuum is the complete opposite, i.e. there is no system.

Although each organisation is individual, it is clear that there are three broad categories which they could be included in. These three categories are:

1) The organisation did not use a system at all. There were a number of councils who reported that they did not use an IT system for their courts and they were not bookable and the general public did not have to pay to play on these courts. There was also one club who managed their membership from a book and their finances from a ledger (Respondent Seventeen).

2) The midrange organisations (typically clubs) used Microsoft Office tools, e.g. Excel and Word, to maintain their accounts and membership records. They did not have a package system and they did not integrate with any other software or system apart from a small number of instances of mail
merge within Microsoft Word. (Respondents Fourteen, Eighteen, Thirty-One, Forty-One, Forty-Four and Fifty-Nine)

3) The larger organisations (larger clubs and councils – Respondents Three, Twenty, Fifty-Seven, Fifty-Eight, Sixty-Two, Sixty-Five and Fifty-Four) used a package solution. The use of the systems within this range varied enormously, from individual packages to support separate applications, through to fully integrated systems that ran all the functions for the organisation. There was no evidence of any in-house-developed software and all the companies contacted used externally written and sourced software. There was no discernable difference between the private, public and trust organisations and how they ran the software. One package, Gladstone, was used by both sectors which confirms that, although the structure and objective of the organisation may be different at an operational level, they were able to use the same functionality.

**IT Systems**

*Sales and Marketing (including membership/Customer registration)*

As discussed, the LTA and regional LTA do not have detailed information on their members because they do not collect any membership information from their fully affiliated clubs (unaffiliated clubs clearly would not provide information). This membership information, at a detailed level, is invaluable in order to promote and understand numerous aspects of tennis. Additionally, information at a detailed level would provide better information into such aspects which would be tracked as a key performance indicator in commercial firms. This would include such items as the membership turnover of a club (analogous to customer turnover for a service organisation).

Understanding customer information is important for an organisation to be better able to target its customer base and understand some basic customer key performance indicators (KPIs). Having the ability to understand where its new customers or members are drawn from by age, income or location demographics is basic to attracting and keeping new customers. Similarly, being able to understand why members are leaving is important to understand. The turnover of customers in an organisation is a fundamental requirement for reporting. Further analysis by demographics, as mentioned above, will give insights into how to structure new membership campaigns for retention, promotions for tournaments for both spectators and
players, as well possible promotions for goods. As mentioned previously, Tesco Clubcard data is used to categorise its customers which is shown by the Clubcard magazine\(^7\), and the LTA could utilise a similar method to categorise its customers and consumers into marketing segments so that targeted marketing can be used effectively.

From the ERP system benefit framework by Shang and Seddon (2002c) in Appendix B they cite as one of the benefits (section 3.7 of the appendix) how enabling e-commerce it will potentially attract new customers or get closer to customers through web integration capability. They highlight benefits such as interactive customer server, expanding to new markets and providing real-time and reliable data enquiries. This last item is also relevant for areas such as tournaments results, ratings and rankings.

As already highlighted, there is no central system to support membership and it is done variously manually, via spreadsheet or database, or with a system from a commercial vendor. Section 7.3 on page 184 gives a sample framework of a membership system as part of an ERP framework which addresses these issues. One of the benefits of an integrated system, which the LTA does not currently have, is that it provides a single, integrated system from a single source (Davenport, 1998). Without such a system, information reconciliation of this nature is very manual and time-consuming.

**Marketing Systems**

There are two principal issues with the CRM and marketing systems in the value chain and network as they currently stand. Firstly, there is the issue of affiliation of the member clubs, and therefore its members. The LTA – the hub organisation – does not know who those people are. It doesn’t accurately know how many people are affiliated as it is not uncommon for players to belong to two clubs, and the commercial clubs are affiliated by the number of courts and not the number of members. Secondly, the other major playing group comprises the 2.4 million players who do not play at clubs. Although this figure was challenged by one respondent, it is certainly a significant figure and the vast majority of these people are not known to any of the organisations identified in the value chain. When asked how systems might help to identify who these people are, Respondent Twenty-Four declined to answer as

\(^7\) Typically this is demonstrated by the front cover of the magazine which shows a picture pertinent to the demographic group e.g. mother, father and children where the card holder is identified as a family member (Respondent Nine).
that information was sensitive due to the fact that this was what their organisation was working on at the moment and was, therefore, company-confidential.

The challenge for the LTA is to increase the number of people on the database so it can effectively use a CRM-based system as it really doesn’t know who its members are, as already stated, apart from the elite players, which is a small number compared with the big picture. Currently the number of men in Britain with an LTA ranking is 3,273 (LTA, 2007b). Equally, the regional LTA only really knows its own elite players, and players who enter tournaments that it organises. Given the success of the Mini Tennis initiative this database will be growing significantly, but it appears that the regional LTA doesn’t have the depth of systems or staff to be able to exploit this information fully using more sophisticated CRM or ERP systems. The devolved nature of the regional LTA would also create an issue.

Using the model identified by Kotler and Andreasen (1995), which involved mass marketing, differentiated marketing, targeted marketing and niche marketing, there is significant activity from a mass-marketing perspective for the Mini Tennis initiative, and the number of players of that age has grown significantly – over a 55% increase in the number of juniors between 2003 and 2006. However, the CRM opportunities afforded by targeted marketing are not possible because the database of people is not available. Along the value chain, therefore, each of the sectors will do some marketing, but there is no coordination across the value chain in order to provide an integrated channel approach. The providers will perform elements of the market segmentation options. For instance, a local club will target the local area for new players in a niche marketing technique via the local paper, leaflets and posters in shops in order to attract new players. Commercial clubs will have a bigger budget to attract new players and will use more varied techniques to increase membership, which would include local radio as an option. Local councils and the local parks do not have the budget or capability to promote the local courts, and these are seldom advertised outside the park gates.

A method of identifying market segmentation could be based around categorisation based on the Balyi Model. Balyi (2001) developed a Long Term Athlete Development Program (LTAD) which is widely recognised and used for elite sports development (Table 10: LTAD Development Stages (Balyi, 2001)). This bears an astonishing resemblance to the product lifecycle, and this aspect would also lend itself to the development of market segmentation for the junior and elite players.
The table illustrates the different training stages that a high-performance player might progress through. The majority of players have little interest in competing (Respondent Six), and Respondents One and Six both commented on the lack of opportunity for competitive tennis in the current environment. There is considerable opportunity to identify a whole range of different-target market groups. The Mini Tennis initiative ensures that players have to play in a number of tournaments and competitions and the data for the entrants could be captured centrally. Each tournament has a rating (if it is officially recognised by the regional LTA or central LTA) and, therefore, the general playing standard of the entrant can be gauged. Similarly, using the Balyi definitions (2001) from the central and regional squads, more targeted marketing can be created. The other major area is the open tournaments that are run around the country throughout the year. Assuming they are officially recognised, the entrants’ information could also be collected, an estimate made of their playing standard, and channel marketing created accordingly.

In order for a CRM system to be effective it is important that there are no fragmented marketing processes which are not integrated with IT and CRM data (Merrihue, 2003), nor marketing objectives that are not aligned with the consumer base. This lack of consumer and CRM data also affects the ability to create personalised data for the website elements. Integrated databases are important to ensure that all data related to people are consistent across all sources and can be used to full effect from a stakeholder and segmentation analysis. Merrihue (2003) goes on to say that a number of companies do not have objective measures which gauge the performance of their marketing campaigns. Without these measures it becomes very hard to assess the performance of the marketing and CRM initiatives.

In addition, there was no perceivable difference in systems usage between the commercial sector and the not-for-profit sector, e.g. council trusts. The usage showed each of the sectors in a similar way and that there was no obvious difference. This is largely to be
expected as the systems are used to provide a service to the public and the systems to support this must key functionality in order to do this.

In summary, the ideal solution is to have an integrated database that is able to store information collected from a number of different sources, including tournament entry information, elite players and squads. Ideally, the system should be able to collect information from a larger number of sources including areas such as membership systems, as discussed in the next section.

**E Business including Websites.**

The key aspect of the Totaltennis website is that it has been designed for all clubs. This “one size fits all” design is very important in the implementation of large-scale IT systems. In fact, it is the underpinning principle of the major ERP system vendors – SAP, Oracle, Great Plains etc. They all rely on the principle that companies have a great degree of commonality around process and function which can be accommodated by a generic ERP system (Davenport, 1998) and those local differences can be accommodated by configuration changes in the first instance, with customisations as a second option. This is normally an issue for large multi-national organisations (MNC) which have multiple operating divisions. However, the same issues apply to the value network for tennis, except that the LTA does not have the control that arguably large corporations might have. They cannot force organisations to take up the Totaltennis website. This aspect of control and configuration of systems is widely recognised, as referenced by Clemmons and Simon (2001) but the proposal they put forward is only effective where the subsidiary hub organisations are of a significant size. They propose to place the majority of functionality within, what would effectively be, the regional LTA organisation. Unfortunately, within tennis, the regional LTAs are not of sufficient size, nor do they have the IT organisation or capability to support this structure. Therefore, the current design of having systems run from a central location would seem to be the only effective solution.

Having confirmed the design constraints, the LTA needs to address a number of concerns that have been raised about the take-up of the use of Totaltennis if the model is to be extended further.

Using the critical success factors discussed in more detail in the section on ERP critical success factors on page 47, a number of issues are identified with the Totaltennis website:
• **Training:** Respondent Fourteen commented that they did not use a lot of the function as it was quite complex and hard to remember where everything was. The volunteers or full-time staff need training on a new system. Even the most intuitive systems will need to have some supporting material or systems to cater for people with differing levels of knowledge and experience.

• **Selecting the right employees:** Clubs often do not have a choice about who does what, as they are, for the most part, volunteers. Even though the facility is provided centrally there is still a lot of work that needs to be done locally and the club needs to have the volunteers to do that if they have no full-time manager or staff to support the system. This was raised by Respondent Seventeen. The volunteer aspect was one of the elements highlighted by Slack (Slack, 1997).

Interestingly, one item that is missing from Bingi et al.’s (1999) list is that of functionality. One would argue that if the tool doesn’t do what you need it to do, then it isn’t any use. As if to corroborate Bingi’s list, DeLone and McLean (1992) also do not reference functionality as such. They talk about use and intent to use and systems quality, as well as information and service quality. Functionality appears to be an assumed entity.

The issue of training cannot be underestimated. This, along with top management commitment, is listed as part of the critical success factors to ERP rollouts (Bingi et al., 1999, All-Mudimigh and Al-Mashari, 2001).

The objective of the website, therefore, is to make it the public face of the LTA and the ERP system which supports it. The intention would be to create a critical mass of usage where it becomes the *de facto* standard for the modules identified in section 3.1.4, in the same way that modern social networking sites have achieved high usage rates.

**Financial Systems**

The extant systems of the organisations involved varied from spreadsheets and even a written ledger up to a top-end (i.e. expensive) financial system in use by a large number of FTSE 100 companies. The organisations involved do not have any financial links in the same way that divisions within a large organisation might have a financial reporting line to the controlling group. However, the tennis clubs within LTA membership have similar financial and legal requirements to be met. As referenced in the previous chapter it is quite common for the finances to be completed on Excel spreadsheets. The model of the SaaS would appear to fit
the clubs’ requirements. The SaaS model allows for a common set of processes to be deployed to an organisation and this can then be customised to fit the specific requirements of that organisation. The software can also be tailored to meet the statutory reporting requirements of clubs in a set of standard reports which could then be easily entered and submitted. This would reduce the burden on the volunteers and reduce the risk of inadvertently misleading the Inland Revenue or Companies House.

**Additional Specialised functionality**

**Rankings and Ratings/Tournament Software**

The ratings and rankings system in use by the LTA is a very highly specialised component of their activities. It is critical in its use and highly sought after by the elite and active playing members of the tennis fraternity. From an ERP perspective it is not a standard piece of functionality that can be purchased from an existing supplier and therefore would need some bespoke development to add to an existing ERP system. The LTA currently has a Siebel system which could support development of this nature. The discussion concerning ERP versus other software developments is later in the chapter.

Where the ratings systems fall down is in the twice yearly update. In the DeLone and McLean Information System success model (DeLone and McLean, 1992) and subsequent updates (DeLone and McLean, 2003) they identify data quality and systems quality as two key variables in the success of a system. A twice yearly update means that the data is too static to be of daily use for a player who may take part in 20-30 different tournaments a year – all of which can affect his or her rating.

As referenced in the previous section on membership, the Shang and Seddon (2002c) ERP benefits specifically cites providing real-time and reliable data enquiries as one of the e-commerce benefits. This fits exactly the requirement for tournament results, ratings and rankings reporting. It is unlikely that most tournaments would be real-time, such as the Wimbledon and other Grand Slam events, but having daily updates would be a major step forward which would also automatically be fed into the ratings and rankings system, so that after each tournament the relative positions would be updated accordingly.

As there is a *de facto* standard for the tournament software in use, there would appear to be an opportunity to utilise this system. Additionally it would be possible to automate the
central collection of data for tournaments that use this software and give a financial or other incentive for other tournaments to do likewise. The data quality and timeliness of data and the opportunity to improve this aspect is discussed later in the chapter.

6.2.6. Summary and Conclusion

In summary, the LTA do not control the resources, and do not control the decision-making process for the selection of IT systems, which would explain why there are such a plethora of systems in a structure with a large variety of organisations with little uniformity.

What is evident from the results of this objective is that the LTA has limited authority over the components downstream in the value chain. Slack (1997, p182) highlighted five elements as the main sources of power within sports. The LTA, by virtue of the fact that it is the National Governing Body for the sport, has in its favour the two components of centrality and non-substitutability. Whether the LTA could be challenged in this role and another organisation take on that position is a highly debatable point and one that is outside the scope of this dissertation. What the LTA does not have is the control over the acquisition and management of the downstream resources and control over the decision-making process. It could be argued that this makes the LTA a rather impotent organisation. It has the position without the authority, and therefore all decisions cannot be mandated. Whilst it is highly unlikely that clubs would start changing the rules of the games autonomously, which would cause complete chaos, the clubs do not have to abide by decisions or recommendations in the administration, coaching or running of the club.

The picture painted is one of poor or little integration between systems. As an example, the membership information held by clubs is held in many different formats, none of which is shared with the LTA or the regional LTA, so it is not possible to market centrally to the club members. It is only achievable by going through a hierarchy, which may or may not be successful. The information quality is generally poor. The only area where information seemed to be updated in a timely or accurate manner was the rankings pages maintained by the LTA. This was updated every two weeks. The use of integrated tournament software would improve this further. The ratings system was deemed to be complex and only updated twice a year which undermines the information and system quality required for a solution of this nature. Overall, the picture is of poor data integration, poor systems integration, many manual systems, and hundreds of separate computer systems. The goal of an ERP system (Davenport,
is to provide a seamless integration of all the information, and the current environment does not meet this criteria.

Schools and universities present a special case as they have bespoke systems for education and would have no requirement for membership, financial or other modules that are specific to clubs and/or councils. However the tournament and results aspects are an area that could be utilised and could be accessed; this is discussed as part of the extended network framework in the next section.

The next chapter looks in more detail at the proposed framework which would give the central bodies a unified system, the potential for improved communication, and functionality for the clubs and affiliated members, as well as improved marketing and CRM potential for the LTA and regional bodies.
Chapter Seven: ERP Framework – Research Question Three

To what extent can an ERP system be implemented in a public and private multi-organisational model?

Having identified the issues raised from the data collection with the current systems involved in the provision of tennis across an extended value network, this research question seeks to develop a framework to establish the extent which an ERP system can be implemented, and provide a platform on which to base an IT infrastructure which will support the organisations in the value chain for the future e.g. for the next ten years. The issues raised in the previous chapter are addressed as separate sections within each heading below.

The goal of the strategic framework is to highlight the benefits of an integrated or ERP system that allows multiple modules to access a single database that would consist of many data tables; a number of integrated modules; and a modern network that allows many heterogeneous devices across, potentially, a number of different organisations. To describe this framework in more detail, this is broken down into three components:

First, a description of a module framework proposal where modules, as described in Chapter Three, are bought together and integrated with the requirements and findings as highlighted in Chapter Six – the analysis and discussion. The second section reviews the options for a data framework; this is a proposal for a single module of membership as an example, and this section also provides a framework for the system as it incorporates components which may be maintained externally and interfaced into the central system. Lastly, the network framework connects all the elements together and also allows opportunity for new channels.

7.1. Centrally Hosted Systems

As part of the framework, the systems would need to be centrally hosted, running on a single server or a set of tightly coupled servers. There are a number of alternatives in running a centrally hosted system. These would include a conventional system hosted and run by the LTA or, alternatively, an outsourced model which is run by the LTA but run on an externally hosted system by a third party. A hybrid of the outsourced model is where the LTA effectively becomes an outsourcing partner to the organisations and users of its services. This could be based on a Software as a Service (SaaS) model. SaaS makes it appear that the service you are
using is your own facility, when in fact you are sharing a number of key components with other users. In the SaaS model the applications are all hosted centrally and the clients (or clubs in this case) have access to the systems, but they look and feel as if they are the only client (Schaaf, 2000). A successful model of this in the commercial world is [www.salesforce.com](http://www.salesforce.com) – a website that provides sales systems support to companies. The organisations themselves do not have any server infrastructure to support this as it only requires Internet and browser access. The model is similar to the one proposed for the LTA to offer to its customers and clients, i.e. clubs and councils.

This model supports the concept of hubs within the scale-free network. The clustering discussed within the club network and also the hubs raised as part of the regional LTA would all be supported by this model. The system can be designed to model different hub frameworks or can be designed to “flatten” out the structure. This aspect is a management decision during the specification stage of the project. This is similar in concept to the idea of multi-organisational frameworks which are used within the financial models within ERP systems such as Oracle Finance (Oracle, 2009). This allows a company to produce the financial reports from a central organisation and to include a number of subsidiary companies which are able to input and report on their own accounts independently.

A complex model from a design perspective would be where there is a single database, which is partitioned in such a way as to look like multiple databases. Other models include having multiple operating systems partitions, although this model is very resource-heavy. Each model has its own advantages and disadvantages which are out of scope for this research. Although this design issue would need to be addressed, from a user perspective they can both be configured to allow central access to data in a simplified and unified fashion.

7.1. Issues addressed

The centrally hosted system is the key element of the research. It fully addresses a number of the issues and partially resolves other issues raised so far in the thesis. It fully addresses issues RQ1a, RQ1d, RQ1f, RQ1h, RQ2a and RQ2b. These issues are concerned with real-time updates and frequency of updates, consistency of data recording and central reporting of information. A centrally hosted database ensures that updates are applied to the relevant data in a timely manner, as opposed to a number of disparate systems being updated independently. It also ensures consistency of data capture and data entry, the data entered into a single system can be entered and stored in a consistent fashion as opposed to different
methods of entry, and storage is supported by many different systems. Additionally, the reporting from a central system is greatly improved. Gathering data from a large number of remote systems can be a costly and time-consuming exercise which is prone to error. Reporting from a single database is a far easier process with more controls.

It also partially resolves or contributes to the resolution of issues RQ1b, RQ1c, RQ1g, RQ2e, RQ2f and RQ2h. This includes the issues of the LTA not knowing who its playing public are. Having a single point of reference where data is input from multiple sources, i.e. clubs, tournaments, councils etc, means that a more comprehensive database can be constructed and referenced. It will never fully address the issue but it will help to bring the data into a single point and further analysis and solutions can be investigated for areas where better data is required. The central database will also enable better quality of data to be entered by improved error and consistency checking that is completed automatically on entry. In addition, the screen design can be improved with design requirements built in for the less experienced and low-use user, e.g. the typical club volunteer.

The single integrated database obviously resolves the issue of multiple heterogeneous databases which have been identified in the various organisations. This single relational database also resolves the issue of integration. This design removes the duplicity of data identified previously and referenced by Davenport (1998) and therefore allows improved data integrity and accuracy.

Having a consolidated database which is able to capture data from many sources (discussed further in the section on data connectivity later in this chapter) also resolves the issue of the LTA not knowing who its members are. Being able to capture data or have data input directly into the database allows this consolidation to take place for easier reporting, data analysis and use within the market function. Extending this further brings the issue of neither the LTA nor councils knowing who is using the public facilities. Having a central court-booking system would allow data to be captured from a wider audience, which can then be utilised as above for easier reporting etc.

7.2. ERP Module Framework

In a commercial organisation that sells goods, as opposed to a service organisation, one would expect to see a more classic implementation of an ERP system. This would include such elements as Order Management and Distribution Management. In the specialised case of
a system to support an extended value chain with a service orientation, and a service that is provided externally, there is the need to take a slightly different view. Figure 17: Stages of E-Business Transformation (Burn and Ash, 2005) shows how a transformation can be achieved for a product-based business, but the premise also holds true for a service-based environment. Stage 3 in the figure shows the realisation of value propositions, highlighting the emerging collaborative online communities, the One2Many vs One2One and the focus on partnerships (Burn and Ash, 2005). The stage 3 planning focus also highlights the relationship building and the community networks, albeit that they refer to Supply Chain Management as opposed to services management. Burn and Ash highlight the use of a dynamic planning model and go on to say that “This is especially so in the area of outcomes and performances objectives where efficiency through employee self-service, and effectiveness through empowerment in customer care is used to support value adding activities for sustained competitive advantage.” The model highlights the aspects of relationship building and leveraging interdependent e-communities.

The goal of the ERP framework is to achieve stage 3 where it is an e-enterprise model with a One2Many value proposition and the focus on partnerships being the objective of the LTA in order to gain value-add in the service transactions.
Chapter Three established the key modules that were used for the investigation phase. This functionality supports operations where the system would not need major revision, i.e. it is available “off the shelf” in a package solution. This would be in the area of financials, HR, EIS, Sales and Marketing (including membership and customer registration). Other areas that are not listed in the Davenport model but are included as standard in the later revisions of the larger ERP systems such as Oracle (Oracle, 2009) are the important modules supporting the CRM systems. Technical functionality includes large-scale email support, XML interfaces support and SMS (texting) support (Oracle, 2009). The Sales and Marketing function, typically, includes support for a customer interaction centre which handles customer and consumer queries.

---

**Figure 17: Stages of E-Business Transformation (Burn and Ash, 2005)**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Dimensions</td>
<td>Stage 1: Integration</td>
<td>Stage 2: Differentiation</td>
</tr>
<tr>
<td>Technology (virtual infrastructure)</td>
<td>* ICT ERP with e-Sales &amp; e-Procurement applins</td>
<td>Differential Resourcing ASP vs cost of ownership on the outsourcing spectrum</td>
</tr>
<tr>
<td>Products &amp; Services (virtual experience)</td>
<td>e-Mails e-Mail integration and information exchange</td>
<td>e-Branding Customisation vs standardisation, Brand identity &amp; integrity</td>
</tr>
<tr>
<td>Examples</td>
<td>Remote experience of e-catalogues. More tasks, “group ware” skills for online communication</td>
<td>Assemble and coordinate assets through effective use of online services</td>
</tr>
<tr>
<td>Dynamic planning focus across stages of organisational transformation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strategic focus</td>
<td>Self-service</td>
<td>Empowerment</td>
</tr>
<tr>
<td>Planning focus</td>
<td>Internal SCM</td>
<td>External SCM</td>
</tr>
<tr>
<td>Outcomes and Performance Gains</td>
<td>Improved operating efficiency (ROI)</td>
<td>Effective resourcing (QWL)</td>
</tr>
</tbody>
</table>

* The diagonal cells (shaded) represent the critical stages of eBT and the arrows represent real organisational transformation with e-business.
The value chain model, highlighted in Chapter Four, can now be updated again to take account of the specific areas of the LTA – see Figure 18. This model is populated using the original data concerning standard ERP modules, listed above, combined with the specialist requirements of the tennis environment as highlighted by the data analysis and research of the previous chapters. The principal changes are in the primary activities area where items added are:

- Membership
- Marketing and communications/ court and facilities bookings
- Financial systems reporting
- Competition management (ratings and rankings and tournaments)
- Coaching support
- Web forum
- Merchandising
- Information portals

Each of these additional areas is discussed more fully below.

![Figure 18: Value Chain Model updated for the LTA Framework](image)

It is important to understand the scope of the implementation. Figure 19 shows the graphic outline of the scope of the access. This is a logical diagram to demonstrate the central hosting aspects of the system, as opposed to a physical network diagram, as the access could be via local LAN, Internet over broadband or even dial-up. The diagram seeks to highlight the
extent of the groups involved who may require access. It is not hierarchical and is not a security schema. Each group would have its own security requirements and there would be many levels of security within each group.

Figure 11 highlighted the aspect of interrelated value chains. This model showed what modern systems architects would call a shared service model as highlighted in Chapter Three. Conventional wisdom says that this model is primarily aimed at large organisations that have a number of different divisions, and in order to save costs they share services. The services shared tend to be the areas identified by Porter (1985) as the support activities. These are typically Finance, HR and IT. In the organisational structure identified, the shared service model in not appropriate due to the autonomous and financially independent nature of the organisations involved.

![Figure 19: Scope of Implementation](image)

**Membership**

As has been identified in the previous chapter there is no single solution or even *de facto* standards for membership systems. This is a very fragmented area, ranging from manual systems and spreadsheets at the basic level through to more sophisticated systems at the more commercial end of the scale. At the simplest level, the point of a membership system is to be able to record how many members there are in the club, and to ensure that the correct revenue
is collected from them. The data analysis showed that the requirement is to provide a system that can support a small number of members through to those with many hundreds of members, the latter which also might be council-based. It must provide a high level of service, systems and information quality as it is dealing with financial information: the member must be billed or invoiced accurately and in a timely manner. The club for its part must also have access to accurate financial information as this is a requirement for company reporting, including VAT.

Having the membership systems hosted would automatically mean that the LTA has access to the consumer information (see later sections on data protection and consumer privacy). Some of the benefits of this type of approach would include the ability to provide a bespoke service for clubs that were not able to afford sophisticated systems. Services such as Direct Debit would add a great deal of flexibility of offering to members and clubs would not themselves need to host any services, including buying hardware, software or other licences. Lastly, services could be provided over the internet using standard browser functionality, therefore they would available to all.

As with the Totaltennis.net approach some clubs will not want to join as they already have systems tailored for their needs and so the on-cost of a conversion to another system would not be cost-justifiable. In this instance, the ability to upload information to the central server over the internet using XML interface technology would allow access to this information. The problem would be that the clubs have no motivation to do this. Although XML technology is fairly straightforward and well defined in the professional world, for the average amateur it would be technically too difficult. Coupled with the fact that the clubs would need to see some benefit in going to the effort and possibly expense of setting up an upload facility on a regular basis, it would be hard to envisage a high take-up.

**Marketing and Communications / Court and Facilities Bookings**

From a marketing perspective, one of the most important aspects is the ability for the system to be able capture customer information. In this instance the principal challenge is to identify who the customer or consumer is. The benefit of holding the customer information, as a tangible asset, is important. As discussed before, the value of the Tesco Clubcard loyalty programme was not only in its ability to induce increase revenues by rewarding spending, but being able to target market segments with highly targeted micro marketing. Each quarterly
mailing had approximately five different covers that reflected the lifestyles to which the customers belonged.

The goal of the framework therefore is to develop a system which can record the consumer or player into the customer component of an ERP framework or into CRM-specialised software.

Modern CRM systems offer a number of features either as part of a standalone solution or as part of an integrated database with additional ERP features. These features include software capability to segment and analyse substantial, homogenous customer segments that allow greater variation on segmentation as opposed to simply on location, age etc (Oracle, 2009). Within the tennis world, the segmentation might more usefully be broken down in accordance with the long-term athlete development programme, as identified in Table 10. It could be used in two ways: One would be to use it “as is” to identify and follow through the elite players, i.e. the training-to-win segment. Although this accounts for a very small percentage of the playing public, it represents a very important sector, as they are the group who are likely to achieve the LTA’s objective of a significant number of players in the top 100 world rankings. The second way would be to segment the playing public into capability. The LTA already has a ratings system which is quite complex (Respondent Five) but does allow players to be grouped together based on similar levels. The principal issue is the amount of take-up amongst the 2.4 million unknown players. See next section concerning connectivity and communications.

As highlighted previously, one of the key issues in British Tennis is that no one knows who the vast majority of players are, what their names, age, gender or ability are, and more importantly there is no record of where they play. One of the key objectives of this framework, therefore, is to work out how to gather this information so that it can be used in a more traditional marketing SMP and CRM environment.

The method that this framework proposes is to use a booking system approach and to extend across the value chain. Currently there are systems which are used by the larger private clubs and the commercial organisations, whereby the only way that people can book courts is to register on the organisation’s database. This would be done in most cases when they pay their subscriptions. At this point, when the member books a court the central system knows the
name and all the relevant details. It may even debit their credit or debit card for the court booking fee if there is one.

The premise therefore is to extend this idea further to the council or local government courts. The idea would be to define the public courts to the database as a facility or an asset. Once defined they would be accessible to the public via an Extranet. Users would need to register their name and other personal details, and once connected could then book the courts from any of the network channels which are available (the next section has a fuller discussion on connectivity). During this registration process there would be the ability to opt in or opt out of marketing opportunities, both from the main provider and from the extended value chain. This registration method achieves a number of things; most importantly, the person’s name is now known, their address possibly, definitely their email address (used in the registration process to confirm the registration) and possibly some other information in the process.

Now that this information is available, from a marketing perspective this gives many different opportunities. Typically, public courts are booked solidly during the two weeks of Wimbledon and are severely underused during the rest of the year (Respondent One and Six). Having the names of people who have played on the courts means that now they can be encouraged to do so again. This could include such things as organised coaching. It is uncommon for public courts to have coaches as the demand is low without a captive audience as in a private club.

It is not economical for councils to employ people be available at all hours to take money for the courts. This is why a number of tennis courts around the country have been converted to skateboard parks etc (Respondents One and Six) which require no maintenance or booking. Having a bookings system where people are incentivised to use the online system reduces the workload for the local park keepers and means that no cash is required to be taken at the court side.

Lastly, having an online booking system will help to increase the number of community players. There are existing online systems where grassroots players can find their local courts. Whilst this is an excellent first step, people may still be put off as they are not aware of their availability, costs, etc. Having found the courts, expanding a system to include booking (which may or may not include payment) would seem a natural extension. Additionally, the online booking can capture the number of players and, optionally, capture
their names as well. The e-commerce element is extremely common with 74% of respondents in a survey (Dutton et al., 2005) saying they had bought something online, so the ability to purchase court time online would be a method with which a large majority of interested players would be familiar.

**Financial Systems**

As discussed previously, all the organisations are financially independent, so the sharing of financial data across the network would be inappropriate. However, in the same way that the membership system itself could lend itself to a Software as a Service model, the financial aspects of the club be dealt with in the same way. The smaller clubs have similar revenue profiles and they will, therefore, have similar requirements for financial reporting which are largely statutory and therefore fairly straightforward to provide basic facilities for the volunteer. As referenced in the previous chapter, VAT is a very complex area and having a standard template for completion by clubs would help to ensure that they do not contravene any of the VAT regulations. At some point the finances will need to be audited by a qualified auditor, so the method of recording data may come under scrutiny. Having an SaaS model that is centrally certified would help clubs to fulfil their statutory reporting requirements quicker and more accurately.

**Competition Management (Ratings and Rankings and Tournaments)**

The LTA use two different metrics for assessing performance. Firstly there is the rankings. This is the position in the national or county listings for individual players. The ratings, however, provide an assessment of playing ability and do not give a ranking position. What a rating allows is for people of a similar level to play together, or for a tournament to be ratings-based, which then allows the winners to move up to a higher rating.

Three aspects would be made possible by a more integrated system. Firstly, having more members (who have a ranking or rating) on the database would allow more targeted marketing. There are ratings tournaments run throughout the year and the ability to target market the players who have a rating in the level of the tournament could improve the attendance from both a player and competitor perspective. Secondly, the ratings need to be updated on a more frequent basis and, again, by linking the ratings systems with email addresses of the individuals so that any significant changes could be emailed to people to keep them up to date. Lastly, the ratings components need to be run more frequently in order to
maintain people’s interest. Respondent Twenty-Four was of the view that the problem with the update of the ratings system was largely an administration problem due to the large number of individual scores to be recorded for all the participants. An online solution that allows a more devolved input, or even participant input online, would help to resolve this. The same respondent is also the parent of a performance player and they thought a three-monthly update would be more useful, and a better balance between admin effort and keeping the interest of players involved. This is very important for the players who are keen and ambitious as their standing could change dramatically during the year. For the younger players this could be especially important in order for them to progress quickly and play more challenging people.

One of the areas that have been highlighted by a number of respondents is the lack of competitive tennis. This is one of the main reasons highlighted due to the fact that the tennis that is played is not conducive to creating the next Wimbledon champion (Respondents One, Two and Six). Having now created a large-scale database means that a tournament such as the London Parks Tournament would be able to be advertised to a bigger audience, and would attract a far bigger entry. The London Parks Tournament was set up to encourage players who may or may not play in a club to play other people of a similar standard and to encourage the use of public facilities. This tournament has declined in popularity over the last few years, and, in fact, Respondent One even believed (erroneously) that it no longer existed. This tournament would be an ideal vehicle for a centralised database approach and would encourage players to play in a more competitive environment. This could be extended to a national competition, as hinted at in the grassroots review (SMC Consultants, 2007). Tournaments are discussed in more detail in the section on the data framework as it offers the opportunity to extend or interface into the proposed data framework.

**Coaches**

Coaches are a major influence on the development of tennis at all levels. This was mentioned in various ways by a number of respondents. The inclusion of the ability to contact (or indeed book) coaches allows a complete service to be delivered to the consumer. Many people do not want coaching and are just happy to play social tennis, but others enjoy having professional coaching to improve their game, whether it is for their own enjoyment or to progress to senior levels of the game. Including a list of coaches would make this a highly useable feature, especially if it were linked to the court and facilities booking module as described above. Having a useable national database would not only allow people to find the facilities, but also to have coaching available without having to join a club.
Web Forums

The web forum module now allows people to start to talk to each other and possibly allow further interactions amongst likeminded people. Forums have good and bad aspects, but a well managed and moderated (or self-moderated) forum can be extremely beneficial. People in the same geographical area can talk to each other and allow a virtual community to be built that ends up with an actual tennis community. Although forums are common, their participation levels can be very varied. One specific example of a specialised forum is a website called www.SportsBase.co.uk which offers a free product called SportsMate. This allows people to search for a person interested in the same sport in the local district, with the ability to specify age, sex and ability. They provide the capability for them to arrange fixtures and share messages, weblogs etc. It is not clear on the take-up of this facility, but it is being run as part of a commercial enterprise which suggests that the company management see this as a value-added service to their other commercial website activities.

Information Portals

The use of information portals across an organisation and, increasingly, across extranets has emerged as one of the most effective ways of distributing, sharing business information, reusing knowledge and helping employees to innovate (Chou et al., 2005). However, this technique is not without issues, not least what it is defined as and what it provides (Brakel, 2003). Brakel makes the point that there is no universally accepted definition of what constitutes a portal. Indeed the term “portal” has been used to describe a static website although prefixing something with “My” seems to magically transport the website into a personalised, information-rich environment. The definition most suited to this framework is “a portal is a gateway to the web that allows the plethora of information on Internet and Intranet websites to be organised and customised through a single entry point”. This means that users can be selective on their choice of information viewing and can modify it dynamically to allow optimal information retrieval. However, having personalised information on current rating or ranking plus tournaments calendars, which the consumer is eligible to enter, would be a big step forward. In fact, in a recent release of the website, the LTA has added some function for tournaments, but there is a long way to go to make it a one-stop shop for personal information concerning all aspects of interest in British Tennis.
7.2.1. Issues addressed

The module framework proposed fully resolves issues RQ1a, RQ1b, RQ1c, RQ1h, RQ1i, RQ1j and all the of the RQ2 issues except RQ2c. This model will resolve the issues listed, such as non-integrated systems, i.e. where there is no single system. In this model data from one system is shared with another and in this centrally hosted model data can also be accessible by the LTA. This enables a central financial recording and reporting facility and enables a central membership database with also data able to be entered by non-LTA tennis playing members, e.g. players who play on council courts (see Marketing and Communications / Court and Facilities Bookings).

The single integrated system also addresses the issue of up-to-date data. This is especially significant for the tournament and competition module where accessibility of up-to-date information is a major selling point of the system. Having a single integrated database means that if data is uploaded or updated in one then this information is available to all, meaning that information can be available on a much more timely basis. This has been identified earlier and is referenced by Shang and Seddon (2002c) as one of the benefits listed in their framework. Up-to-date data was referenced by Respondent Seventeen as the reason why their website fell in to disuse, and Respondent Twenty-Four referenced the effort required to keep information up to date. Applications of the importance of the up-to-date data would include examples such as membership information and tournament information, which also feeds the ratings and ranking tables.

Using the Shang and Seddon (2002c) framework, the benefits of this approach would include operational benefits and cost reduction from the club perspective as they would not need to purchase software, hardware or other outsourced infrastructure. There would also be productivity enhancements both centrally and also by the end user, as there is only one system and therefore centrally there are no integration costs, and training costs would be reduced. From the club perspective, although there would be an initial training period, help could be provided centrally, whereas as there is such diversity of systems it would not be possible to have a central or regional help facility.

The membership and online booking option begins to address the issue of the LTA not knowing who the majority of the tennis-playing public are. This is a requirement that was identified by a number of requirements in different forms, i.e. RQ1b and RQ1c for non-LTA members. Capturing information via membership and a booking system from more people
builds the information in a central database that can be used for marketing opportunities for coaching, tournaments (both spectating and participating), and other promotion and marketing opportunities.

The court booking system has a number of benefits which resolve a number of issues. One of the principal benefits is that it provides the facility for the councils to offer an online booking facility for its customers which would be seen as a positive service to its customers. The other major benefit covers the marketing aspects: Issue RQ1c says that the LTA do not know who plays on the council courts and therefore that information cannot be used for any direct or online marketing campaign. This also supports the resolution of issues concerning unattended courts, how many players were occupying the court, and the consistency of recording of information. These are issues RQ1d, RQ1e and RQ1f,

The Competition Management module resolves two principles issues. The first is that the module framework proposed resolves the issue of central reporting being time-consuming and difficult, and secondly that there are no real-time or near-real-time updates for the tournament and competition information. Having a single Tournament Management module allows consistency of connection and updates from the various tournament organisers around the country. XML technology referenced previously in the membership section would also allow consistency of data upload, allowing data to be uploaded and available automatically.

Centralised coaching facilities were raised as an issue and a central coaching module is proposed in this framework which specifically addressed issue RQ1h. Having a module that allows LTA-registered coaches to be able to be searched for and integrated with other modules such as local clubs, council courts and court booking simply makes it easier for the consumer to find what they need quickly and easily.

In summary, the module framework addresses a number of issues and is the heart of the functionality of the system. It is what the user sees and how the system is used to deliver benefits to the organisations and consumers alike.
7.3. ERP Data Framework

ERP Data Framework

![ERP Data Framework Diagram]

Figure 20: ERP Data Framework

Whilst it is out of the scope of this research to suggest a complete data schema for the proposed framework, it is important to highlight some of the key sets of data tables which would need to be included in the system.

A proposed design of the data flows involved in the membership data flow diagram (DFD) (Pressman, 1996) would be as shown in Figure 21: Membership Data Flow Diagram. This design shows the potential data flows for membership for either a new member or renewal. On the input side, as a new member, the person would need to provide basic information such as name, address, age, etc. As a renewal member, assuming that no other information had changed in the meantime, then a simple flag to indicate current membership or a new membership end date is also another possibility to indicate renewal. These would be updated in the membership system that would either be local or, as mentioned in the previous section, as an SaaS offering from a central facility. In the first case, the data could to be transmitted to the central database to be included in the customer database. On the output side the diagram shows the data being made available to the LTA and also the enrolled member information being made available to the renewed or new member, which may include a membership number or cards as examples.
This model is not meant to be a definitive process flow diagram, as this would then include such items as filling in application forms, payments, etc. The principle is to show how a local and central database system might interact and how the local and central elements might be defined.

The area of metadata is also important regarding the quality of data, especially given the potential number of users and the quantity of data itself. Although a recent paper discussed the issue of metadata in an e-commerce context (Manouselis and Costopoulou, 2006), the issue is still applicable to this data model. The quality of data resources is considered to be a key issue that affects consumers when purchasing online, as this model allows the potential to do that.

As mentioned in Chapter Three, in the sections on benefits and the two case studies referenced, ERP offers significant benefits to the organisation or organisations. Typically, it supports a predefined number of modules which are common to “normal” organisations (see Table 2). Where an organisation has niche software requirements, such as tournament software, the organisation has a number of choices. Light (2001) identified a number of differences between the two solutions, i.e. buying in specialist software and interfacing into the ERP system, or writing additional modules bespoke to the ERP architecture. In the instance of the tournament software, the pragmatic approach is to utilise an interface to
existing software which is in common use, and to write an extension to the ERP system for the development of a central viewing interface. In this way, there is less change for clubs already using the tournament software, and the central system gets the full benefit of the integration of the central database.

The issue of “ease of use/use” was raised by DeLone and McLean (2003) which has been discussed previously. Good systems design will address the issue of ease of use and use. This requires a robust systems design methodology (Pressman, 1996) in order to capture the requirements and ensure that the users’ skill and knowledge levels are also taken into consideration. This is an important aspect as it will in turn affect the training issue of the users who are likely to be predominantly volunteers. This in turn affects the overall take-up of the system.

7.3.1. Issues addressed

The data structure is a very important element of the system. Although the mechanics of a data structure of a system should never be seen by the consumer it is important to have a well designed data base schema in order for the system to operate efficiently and also provide a structured design for future enhancements. This last element specifically addressed issue RQ2d which is the requirement to meet the diversity of user requirements in the current proposal and also future requirements. It also partially meets the issue concerning the quality of data input (RQ2e). A well structured database enables data to have full referential integrity; i.e. data elements correlate with other data elements so that there are no orphaned records such as members of a club but the club is not on the database.
The Extended and Virtual Enterprise described in section 3.1.5 in Chapter Three highlighted the opportunities for improved communication between enterprises. This could be between cooperative organisations or divisions, to create shared services or, whether it was at the Extranet or collaborative networking layer, to provide added value to the customer or consumer.
From a technical perspective, the capability to hold significant numbers of records is now quite commonplace, and many hundreds of websites routinely hold databases of several million entries. A greater technological challenge is to provide access to this data.

Multi-channel access is a key aspect of the CRM framework as it ensures that access to and from the database is designed, and information can be closely aligned to the organisations’ needs and wants. Having identified the segments as described in the section on CRM and segmentation, it then becomes possible to decide how to best communicate with the chosen sector across an appropriate channel. Such channels would include call centres, emails, web and mobile phone technology, including SMS and video. Each one has varying degrees of costs associated and would need to be used cost-effectively for the type of communication required. Using appropriate channel access can greatly improve the response rate from less than one percent for unsolicited unprompted generic offers, to 25% to 50% where organisations have been able to tie offers to recent enquiries.

It is not appropriate to go into the technology aspects of the network implications of such a system in this research. Suffice to say that it is very complex but well understood in large organisations. With the use of standardised communications protocols it is possible for organisations to leverage improvements in communications infrastructure without worrying about the information systems supported (Rao, 2000), although an opposing piece of research suggests that the increasing use of the internet has raised the biggest challenge facing ERP suppliers where they need to develop new functionality on a continual basis in order to keep up with technical innovations (Al-Mashari, 2002).

One aspect to highlight from the network proposal is the inclusion of local servers. Although modern networks have become extremely resilient, it may not be appropriate or desirable to have the all parties directly connected to the database. What may be more appropriate for some of the extended value chain organisations is to have the capability to interface into the central database, and for them to hold their own database and provide a pseudo real-time interface to the central system. The use of XML as an interface tool is now very well understood; it provides a natural evolution for connectivity between modern systems but it also provides an interface for legacy-based systems as well (B.L.Lim and Wen, 2002).
An example where this kind of network design together with integrated software may be used to good effect is with tournament information. There are many different tournaments running all through the year for all levels. Before the event, players in tournaments could provide personal information (name, age, sex, rating…); then information that is produced from the event (results) is a very valuable asset. Having that information used as part of targeted marketing before the event and having results available immediately after the event for viewing and to update the ratings on a monthly basis, as an example, would be a considerable marketing asset.

These results need to be entered into the central database accurately and quickly so that the LTA can realise one of the ERP benefits highlighted (Shang and Seddon, 2002c). Currently the information has to be sent to the LTA on cards either by the player or the tournament organiser. The idea of having a central database with improved connectivity would allow tournament results to be entered either directly into a data entry screen, or uploaded at various points during the tournament. Using the Tournament Planner software described previously, with a modified upload facility (preferably using an XML style schema), would allow LTA-affiliated tournaments to retrieve data on a daily basis from the tournament organiser. This data could also include player information and, as a basis for CRM, information of similar tournaments that they may be interested in could be sent out to the players. This kind of targeted marketing would encourage increased attendance at all events, and with faster updates for the ratings listings may create a virtuous circle of playing in order to improve their rating. In the same way that supply chain management seeks to optimise the supply of goods to its suppliers (Al-Mashari and Zairi, 2000) so then could the LTA reduce the time to get results public and then make them available on a daily basis from a central website.

7.4.1. Issues addressed

The network framework proposed provides network connectivity to the centrally hosted system but does not answer any issues directly. However, it acts as an enabler for people to use the system and realise the benefits. This underlying infrastructure enables other benefits to be delivered and does not deliver benefits in its own right. The infrastructure cost is seen as part of the cost of the overall infrastructure and a vital part of the operation. Other areas that would be included in this category would typically be the central server cost or cost of outsourcing. The list of areas where this is an enabler to the issues is shown in the issues summary table as part of section 7.5 Table 11.
7.5. **Issues Summary**

The previous sections concerning the module framework and the centrally hosted database address the following issues raised in the iterations of the research questions. The table at the end of this section breaks down each requirement and how it is addressed by the four main areas of a centrally hosted system, the module framework, the data framework and the network framework. A “Y” in the box denotes that the requirement is fully met by the area shown, and the “P” denotes that it is partially met.

- **RQ1a** *The tournament and rating and rankings updates are not real-time and can be several months between updates in the instance of the rankings system.* A central database systems means that data entered from one source is immediately available to other systems. Therefore information concerning tournament winners can be processed as it arrives and made available to other modules such as the ratings and rankings system. The decision on how often the leagues are updated is then a management decision as opposed to constraints of an IT system.

- **RQ1b** *There is a large majority of the LTA members in affiliated clubs who are not known to the LTA.* Again a centrally hosted database would be able to support the membership systems of all the affiliated clubs and this could then be made available for marketing and promotional purposes. The membership module is discussed in more detail in section 7.2 previously.

- **RQ1c** *There is a large majority of the non-club players who are not known to the LTA, i.e. those people who play on council courts.* As part of the module framework an online booking system is proposed for public courts which could capture information about who they were and additional personal information in a central database. This could also interface to other IT systems to capture information about the tennis-playing public. Considerations about data confidentiality need to be considered and this is discussed Implementation Concerns affecting data protection and consumer privacy on page 203.

- **RQ1d** *A number of local council courts provide courts which have no attendants on site and therefore people can just turn up and play. There is no booking facility, either chargeable or not, and therefore the local councils do not know their usage from capacity perspective or who the people playing are.* Having a central database with an online booking module accessible by the internet would mean that a central booking system could be made available at very low cost (or free) to the councils. This would allow the courts to be booked which would be beneficial during busy periods and allow
the council to assess the occupancy of the courts as well as capturing customer information.

- **RQ1e** *The councils do not know if the court was occupied by two or four players.* The concept of a central database which is accessible and updatable by council staff and the public alike allows for more information to be captured for further analysis. This would allow for the information to be gathered for the court that is booked,

- **RQ1f** *There is no consistent recording of player information by the local councils and again they do not know who is using the courts.* See response to RQ1d.

- **RQ1g** *There is no central decision-making process.* The central database reinforces and enhances the role of the LTA as the central point of the tennis-playing environment. This position has been identified by the revised value chain model Figure 14 on page 139. As the LTA would hold considerable information about the tennis-playing public, both from affiliated and non-affiliated consumers, they would reinforce their position as the principal body in British Tennis. Additionally, an ERP system will not change the organisational structure of the organisations involved and, therefore, this will not be directly addressed. However, the point above demonstrated that the LTA central position would be enhanced and this may mean that although it would not have control it may be in a position to influence more strongly.

- **RQ1h** *There is no central coaching support system.* The central database design and modular framework supports the inclusion of a coaching support system where information on local coaches, club and council facilities would be available.

- **RQ1i** *The number and diversity of the organisations involved in the provision and support of British Tennis.* The thesis does not attempt to comment on the organisational structure of the sport and the objective is to ascertain how a large-scale ERP system could support the existing infrastructure. As such, within the existing part of the value chain a number of scale-free hubs were identified (a large club supporting a number of smaller ones, PESSCL model, the LTA and regional LTA). The central database concept supports the scale-free aspect of the value chain and is only bounded by the capacity of the central system which is an issue of cost.

- **RQ1j** *There are organisations that have a strategic role and organisations that have an operational role and the LTA links these two different positions in as much as it has both strategic and operation responsibilities.* The framework proposed is designed to address the operational role of the LTA and any organisations that have operational responsibilities within the umbrella of British Tennis. It is designed to support and
enable the strategic objectives of the organisations via the operational organisations discussed previously.

- **RQ2a** *No single software system is use and little commonality of systems* – *no integration of data.* Clearly a central database addresses this issue directly. It provides a central hub where a single database would provide absolute commonality of systems and 100% integration of data.

- **RQ2b** *Central reporting of information is difficult and time-consuming to produce.* Having a central source of data means that information can be collated and reported on from a single source which is productive from both a resource and a data accuracy prospect.

- **RQ2c** *Mandatory versus voluntary usage of software.* See response to RQ2g below.

- **RQ2d** *Diversity of requirements in system usage.* As the requirements are gathered as part of a systems design methodology (Pressman, 1996) then the diversity of requirements can be addressed and resolved as part of the single implementation.

- **RQ2e** *Quality of data input.* A central system can be designed to be able to improve the data validation on data entry. This would allow the data accuracy to be improved which is vital in an ERP system as the data is only held once. As mentioned previously, if the data is inaccurate with a single database then it is wrong for all the modules that access it. However, techniques are available (outside the scope of this research) to validate the data on entry which can improve the overall data quality. This was also raised as key component by DeLone and McLean (2003).

- **RQ2f** *The use of volunteers to run and input data.* The use of volunteers in this environment cannot be removed. They are an important aspect of the delivery of tennis, as has been identified in the LTA annual report (Lawn Tennis Association, 2009). However, good systems design should address the issue of the use and ease of use as identified by DeLone and McLean (2003), which in turn will address the intuitive usage, which in turn will improve the training and take-up issues.

- **RQ2g** *The take-up and failure of total tennis initiative.* There are identified a number of issues concerning the take-up and failure of total tennis within the club structure. These include the ease of use and the difficulty in people’s ability to ‘pick it up’, i.e. the intuitive nature of the system. Also there were elements of training and the use of the system by volunteers which caused significant issues with the implementation and its eventual demise.

- **RQ2h** *No targeted marketing.* The central database and marketing module with CRM capabilities addresses the issue of targeted marketing. This facility allows customer
data to be collected and then used as part of targeted marketing campaigns based on the LTAD model (Balyi, 2001) or via market segmentation based on the rankings or ratings, as two examples or options available.

<table>
<thead>
<tr>
<th>RQn</th>
<th>Statement</th>
<th>Central System</th>
<th>Module Framework</th>
<th>Data Framework</th>
<th>Network Framework</th>
</tr>
</thead>
<tbody>
<tr>
<td>RQ1a</td>
<td>The tournament and rating and rankings updates are not real time and can be several months between updates in the instance of the rankings system</td>
<td>y</td>
<td>y</td>
<td></td>
<td>e</td>
</tr>
<tr>
<td>RQ1b</td>
<td>There is a large majority of the LTA members in affiliated clubs who are not known to the LTA</td>
<td>p</td>
<td>y</td>
<td>y</td>
<td>e</td>
</tr>
<tr>
<td>RQ1c</td>
<td>There is a large majority of the non club players who are not know to the LTA i.e. those people who play on council courts.</td>
<td>p</td>
<td>y</td>
<td></td>
<td>e</td>
</tr>
<tr>
<td>RQ1d</td>
<td>A number of local council courts provide courts which have no attendants on site and therefore people can just turn up and play.</td>
<td>y</td>
<td>p</td>
<td></td>
<td>e</td>
</tr>
<tr>
<td>RQ1e</td>
<td>The councils do not know if the court was occupied by two or four players.</td>
<td></td>
<td></td>
<td></td>
<td>e</td>
</tr>
<tr>
<td>RQ1f</td>
<td>There is no consistent recording of player information by the local councils and again they do not know who are using the courts.</td>
<td>y</td>
<td></td>
<td></td>
<td>e</td>
</tr>
<tr>
<td>RQ1g</td>
<td>There is no central decision making process.</td>
<td>p</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RQ1h</td>
<td>There is no central coaching support system</td>
<td>y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RQ1i</td>
<td>The number and diversity of the organisations involved in the provision and support of British tennis.</td>
<td></td>
<td></td>
<td>y</td>
<td>e</td>
</tr>
<tr>
<td>RQ1j</td>
<td>There are organisations that have a strategic role and organisations that have an operational role</td>
<td>y</td>
<td>y</td>
<td>y</td>
<td>e</td>
</tr>
<tr>
<td>RQ2a</td>
<td>No single software system is use and little commonality of systems – no integration of data.</td>
<td>y</td>
<td>y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RQ2b</td>
<td>Central reporting of information is difficult and time consuming to produce.</td>
<td>y</td>
<td>y</td>
<td></td>
<td>e</td>
</tr>
<tr>
<td>RQ2c</td>
<td>Mandatory versus voluntary usage of software</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------</td>
<td>---------------------------------------------</td>
<td>---</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RQ2d</td>
<td>Diversity of requirements in system usage.</td>
<td>y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RQ2e</td>
<td>Quality of data input.</td>
<td>p</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RQ2f</td>
<td>The use of volunteers to run and input data.</td>
<td>y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RQ2g</td>
<td>The take up and failure of total tennis initiative.</td>
<td>y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RQ2h</td>
<td>No targeted marketing.</td>
<td>p</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Key: Y = Fully resolves issue  
P = Partially resolves issue  
E= Acts as an enabler to resolving the issue

Table 11: Requirement Matrix

7.6. ERP System Benefits

Chapter Three highlighted a number of benefits of an ERP system approach. Davenport (1998) also highlighted the allure of a major system of this nature as being able to reduce the fragmentation of information across a large business and, by implication, how this could improve information fragmentation across an extended value chain.

Using the Shang and Seddon framework (Shang and Seddon, 2002c) a comprehensive list of tangible and intangible areas where improvements could be made using an ERP approach is provided. The specific benefits for the LTA and British Tennis are highlighted, using the five headings identified below:

- **Operational benefits: cost reduction, cycle time improvement.** Perhaps the most obvious reduction in cycle time is the ratings run. As discussed this is the twice yearly update of the ratings for British players which is a serious issue for competitors. The suggestion from the author would be to make it a monthly run. An integrated ERP system that allows automated or regular inputs from tournament software and a more frequent system run would encourage more people to access the site more frequently and also reduce the load at peak times (as noted the system was virtually unusable on the morning of the update). Having a common framework would mean that ideas for operational benefits could be shared by all users.

- **Managerial benefits: Improved information for decision making, better resource management.** These benefits can be taken at two levels. Firstly, at the NGB level, where reporting on group or national statistics would be possible. This would include the number of players, and also the ability to break this down into valuable
demographics such as age, sex, location and also, if recorded, items such as disabilities and other personal information. Having information at a more detailed level also allows more detailed analysis. This might include the annual turnover of members in a club. From a national level, it would then be possible to benchmark the overall membership turnover, and this can then be used to create programs to improve the situation. This would also be able to be measured over time which gives longitudinal information on national trends. At a club level more information on membership demographics and turnover is very valuable as identified, plus other reports such as late and non-payment of subscriptions.

- **Strategic benefits**: *Support business growth, support innovation, leadership and differentiation.* Davenport (2000) identified improvements in new approaches as being important and Shang and Seddon (2002c) talk about innovation as also being important. Having accurate up-to-date data for deciding future courses of action for innovation in new initiatives, new marketing campaigns and other ideas. This would demonstrate leadership and could help to reinvent tennis as a national pastime.

- **IT Infrastructure benefits**: *Cost reduction in infrastructure, improved capability and flexibility.* The initial costs of such a system will be high but the overall saving across the value chain and network could be considerable. The cost saving could be realised across all the organisations and would allow much improved utilisation of software and hardware costs as these are now managed centrally, and considerable economies of scales and usage improvements could be realised.

- **Organisational benefits**: *Empowerment, shifting work focus, building common visions and increased employee morale and satisfaction.* This aspect focuses on the more intangible benefits. A typical change curve would normally show a dip in confidence and morale but then these would be increased once the initial issues are resolved and the staff have learnt how to use the new system. This then allows people to realise cost savings and also use the new system features and capabilities to allow further innovation and strategic improvement. From a peer group perspective, this approach would raise the LTA to be seen as one of the most innovative and technologically advanced groups.

In summary, there are significant benefits to this approach in the areas of operational improvements, organisational benefits and strategic positioning. However, an implementation of this size is not to be taken lightly, and there are companies that have experienced operational and financial difficulties from implementing systems of this nature. Whilst there
are many factors that would contribute to the issues, there are some basic methods which would help to mitigate or remove these risks. These are covered in the next section.

7.7. **Value Creation and Ecology**

Pitta and Laric (2004) pointed out that value chains are neither linear nor sequential, but in practice are a complex network of relationships that can be circular and iterative. It is in this complexity of interrelationships with a value chain that the next generation of thinking concerning the value aspects became apparent. Hearn and Pace (2006) recognised the shifts in thinking, which are reviewed in turn in light of the proposed framework:

- Shift from consumers to co-creators of value. This aspect repositions the LTA members and public tennis consumers into contributors and recipients of information in order to add value to the overall process. An example would be a tournament or individual which is able to update their tournament results real-time and then be able to see the results of this action quickly, i.e. how it has affected their position in the ranking. They have added value to the system by the addition of up-to-date, accurate data. This up-to-date information will affect other users’ rankings and therefore the update has added value to the overall information position.

- Shift from value chains to value networks. This aspect has been discussed at length under the heading of the revised value network (Figure 14). The new Pitta and Laric (2004) model shows the revised network and demonstrates the complexity as opposed to a sequential or linear value chain.

- Shift from product value to network value. This refocus takes the individual aspect or value of the service (in this instance) and seeks to promote it across the whole network – taking a more holistic view of the product or service. In this instance, this would be take the various aspects of tennis being promoted and disseminate this across the value chain to create overall network value.

- Shift from cooperation and competition to complex co-opetition. The clubs, commercial organisations and council facilities are all, effectively, in competition with each other for players and members. What this framework allows is for better information to be disseminated across the various organisations and co-opetition to be promoted. An example would be where clubs offer coaching to players at the local council facility where coaching is not available, or a council facility that runs a tournament that is open to all players in the local district. Both activities add value to the other’s proposition without threatening the other’s
income or membership. Both these activities can be logged to the central database and promoted from a central or local agency to promote tennis as a whole.

- Shift from an individual firm’s strategy to thinking about the value ecology as a whole. This involves a complete rethink in the structure and objectives of the whole of the value network as identified. This kind of restructure is out of scope of this thesis but is fundamental in improving the management systems as recognised by the Game Plan in the opening chapter and using the ERP system to enable this change by facilitating improved communications, systems and data flows across the value ecology.

In summary, the value chain can be used to move to the next iteration of organisational interaction and structure, such as is proposed by the value ecology, and the ERP system proposed can be used to enable this with improved sharing of information and systems.

7.8. Implementation Concerns

New System Introduction

Slack (1997, p182) identified the issue about the control over the decision-making process as being important and this then highlighted the issue of the lack of the ability of the LTA to mandate a new system to the downstream value chain. This means that it must “sell” any new system based on influencing and benefits to its users. This might be in the form of financial benefits, i.e. the clubs get something for nothing, or it might be in the form of improved systems for its volunteers to manage and promote the club. The LTA could offer reduced subscriptions for clubs willing to take up the membership in return. This aspect of system take-up must be addressed in order to ensure a critical mass is reached. The Totaltennis website take-up proved that there needs to be a coordinated campaign from the centre to encourage and coerce clubs to use the system either natively or via XML uploads, as discussed in the section on data frameworks.

Organisation Issues

It can be very simplistic to recommend a framework or a major project implementation to an organisation. One of the harder aspects of a major systems implementation is the people and organisation issues that go with it. A lot of ERP implementation literature gives the impression that creating an integrated technological platform is somehow a linear process, but this is often not the case (Scott and Wagner, 2002). Additionally, the implementation of a multisite ERP project can be complex on a number of levels (business strategy, software
configuration, technical platform and management execution) and each site or location will raise different technical and project issues (Markus et al., 2000). One of the obvious things to say about systems is that for all the automation that can be put in place it will still need people to run it and create the new ideas. One of the classic Venn diagrams used in new systems design is the so-called People/Organisation/Technology (POT) diagram (See Figure 23: POT Diagram (Laudon and Laudon, 1995). This demonstrates the balance that needs to be in place for a new system to be successful.

![Figure 23: POT Diagram (Laudon and Laudon, 1995)](image)

The issue of mandated systems has been raised earlier in section 6.2.2 where the concern raised by DeLone and McLean (2003) highlighted the issue that the implementation would engender a sense of disempowerment and has the potential to create problems with the users and the implementation overall. This disempowerment needs to be addressed as part of the change management aspects of the implementation. Again, referencing the POT diagram in Figure 23, the people and organisation issues need to be addressed to ensure that concerns about extended control from the centre are addressed and resolved.

The organisational issues should not be underestimated and all similar projects have to overcome a number of barriers to implementation. Robey et al. (2002) highlighted two specific
barriers: one was those associated with the configuration of the ERP package and the second
was the assimilation of the new work processes. These two items are at the heart of the
implementation in as much as the configuration changes and the functional processes dictate
the way that the package is used and, hence, how effective it will be in its use. In one piece of
research into the process-based measurement and performance of systems, the companies
reported results well below expectations, and it transpired that those were the companies who
implemented the ERP system on a “simple” basis without organisational integration (Beretta,
2002). This organisational integration should also be highlighted at a cross-functional level
(Kim et al., 2005). This level of integration also needs to work at the network, database and
web-enablement levels (Al-Mashari, 2003).

One other issue that is harder to quantify is that the there should be good stability of
the existing legacy systems. In trying to replace an existing system it is important that the
legacy system is sufficiently stable as to produce consistent results, which may sound like a
basic requirement but is not the case in all installations (Trunick, 1999).

<table>
<thead>
<tr>
<th>Phase</th>
<th>Muddle-through approach</th>
<th>Task and technology approach</th>
<th>Organisational and end-user approach.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Initial awareness</td>
<td>Vague awareness that new technologies are available.</td>
<td>Staff viewed as costly resource to be reduced if possible. Concern with operating costs, flexibility and operational control.</td>
<td>Staff viewed as cost which should be better utilised. Concern with operating costs, quality, flexibility and organisational integration.</td>
</tr>
<tr>
<td>2. Feasibility Analysis</td>
<td>Fascination with technology. Short-term returns sought. Expectation that technology can be introduced into existing operational structures.</td>
<td>Mainly management project team but includes technical experts and is approved by top management.</td>
<td>Diverse and representative project team approved by top management. Search for ways to use and involve staff better. Priority given to system potential, rather than machine capability.</td>
</tr>
</tbody>
</table>
### 3. System Design

- **Reliance on technical experts.** Technology seen as controlled by inherent laws.
- **Tasks broken down into their constituent parts.** Engineers and technical consultants seek technically neat final design.
- **Ways sought to improve and enrich jobs and improve teamwork.** Designs are compatible with individuals and groups.

| 4. System Implementation | Unexpected problems with system bugs, staff motivation and industrial relations. Unexpected need for staff training. | Minor modifications only are expected. One-off skill training for operators. Operational responsibility passes to line management. | Continuing staff and organisation development expected. Ongoing view of system operation but as part of normal process. |

**Table 12: ERP Implementation Stages**

One model (Table 12) shows three ways that new technology can be introduced into the workplace (Arnold et al., 1998).

Equally, there are other models that can be used for various stages of project approach and development. These include transform and transaction mapping for the design stage (Pressman, 1996), waterfall and v-process models for a development structure approach (Hughes and Cotterell, 2002); and the government sponsor *de facto* standard of PRINCE and PRINCE2 for the project management approach. Similarly, the government-sponsored ITIL (IT Infrastructure Library) provides infrastructure guidelines and frameworks for areas such as change management, problem management and incident management (Taylor et al., 2007). The use of a recognised standard as a model for implementation is essential but the selection of model is down to the decision of the management team based on a number of factors, including staff skill set, training, available tools, success or failure of previous projects, and many other factors.

It is beyond the scope for this research to review all the aspects of project management, change management and other cultural issues involved in the implementation of a large system. Suffice to say that senior managers and project managers ignore these issues at their peril as they have a significant effect on the success of the project (Huang et al., 2004, Scott, 2005).
Technology Acceptance Models

One of the areas that has eluded IT practitioners over the years is how to effectively measure the success, or otherwise, of a systems implementation. A number of models have attempted to do this. They would include proposals such as the Unified Theory of Acceptance and Use of Technology (Venkatesh et al., 2003). This brought together several models in an attempt to provide a single ‘unified’ model. Similarly, a modified version of a marketing SERVQUAL survey attempted to measure IS success via that vehicle (Whyte and Bytheway, 1996). Both of these models had issues. Specifically either they were very new, did not have an academic review, or were not highly taken up.

However, the DeLone and McLean IS Success model (1992) has been around for a while, has considerable academic review and critique, and has been enhanced and modified accordingly. The DeLone and McLean IS Success model, by their own declaration, has a significant academic background of review and applied usage in the field. From a simplicity point of view the model is intuitive and succinct. The logic flow is easy to understand and, whether this is causal or temporal, it is still straightforward to implement and follow the logic through to perceive a net benefit. The use of the measure of net benefit is in itself a simple concept to understand, and takes into account a large number of variables in order to ascertain an overall value. The applied usage of the model has highlighted some practicalities that are relevant for the practitioner, for example: information quality has a high degree of significance on the overall net benefits. The ability to be able to put a measure on this value has some positive benefits for the IT department. The authors have also had the opportunity to review their own model in the light of academic input and their own applied usage, and have refined the original model to improve the overall efficacy. The inclusion of the service-quality aspect in this revision is an important evolution of the model to acknowledge the changing demands of IT users for more service-based solutions, as opposed to the predominately functionally based solutions of previous iterations. Where the model needs careful thought is that the user must develop their own questions for each of the boxes in order to measure that aspect. DeLone and McLean have developed the tool for the e-commerce environment and they provide a sample set of questions for this.
This kind of model would enable the different aspects of a system to be evaluated by its user base in order to input into the next generation. The feedback loop is essential to improve the system and ensure that lessons are learnt, and is a basic function of good development and project management (Office of Government Commerce, 2005).

**Mandated versus Voluntary Systems**

The uptake and use of IT systems in a voluntary environment as opposed to a commercial environment has different aspects which are important for the systems implementer. In a mandated environment, where the user must perform certain functions, the importance of their beliefs and attitudes is not relevant and they may not like performing the mandated behaviour but are required to do so (Brown et al., 2002). Brown et al. specifically cite the issues that may surround mandated ERP systems where employees do not have a choice as the system must be used as it is, tightly integrated with other areas of the organisation or value chain in this instance.

Within this environment there would appear to be levels of mandated and voluntary use that would not necessarily be the same as within a profit-based, salaried organisation. It is possible that a club may mandate the use of the central system, but the volunteers may not like
it and therefore not use it. This is similar to the case reported by Respondent Seventeen where the club had decided to use Totaltennis but there was a lack of volunteers to maintain it. Certainly, within the financial world, even if clubs had a financial package, e.g. Sage, some of the accountants who produce the accounts may prefer to still use spreadsheets, as that is what they are comfortable with. With volunteers it may be especially difficult for the club leadership to mandate the use of a system.

Brown et al.’s (2002) research used a modified version of the technology acceptance model referenced in the previous section and incorporates aspects of perceived usefulness and ease of use. These two measures would seem to be very significant for system use which isn’t mandated. The system has got to provide a high degree of perceived usefulness, and an equally high ease of use quotient, in order to attract a critical mass of usage and for the full system integration benefits of an ERP system to be realised.

**Data Protection and Brand Protection**

Having sophisticated systems which allow vast amounts of information to be held about individuals can create tremendous opportunities, but this needs to be regulated from an official perspective concerning personal data. In the UK this is regulated by the Freedom of Information Act.

An extract from the Freedom of Information website (Government Website, 2007) highlights some of the key points:

“*The Act works in two ways. Firstly, it states that anyone who processes personal information must comply with eight principles, which make sure that personal information is:*

- *Fairly and lawfully processed*
- *Processed for limited purposes*
- *Adequate, relevant and not excessive*
- *Accurate and up to date*
- *Not kept for longer than is necessary*
- *Processed in line with your rights*
- *Secure*
- *Not transferred to other countries without adequate protection*
The second area covered by the Act provides individuals with important rights, including the right to find out what personal information is held on computer and most paper records."

The area of data protection is important to ensure that all data held is compliant with the act and that the LTA itself registers as part of that data compliance. As part of the implementation personal data will need to be assessed in line with the act and such items such as CRUD matrix may need to be developed (a CRUD matrix is where the data is analysed for Creation, Read, Update and Delete criteria). This would specifically apply to the area of personal data such as name, address, DOB etc.

Having personal data available to use for marketing purposes means that there is a potential increase in activity which would be highly targeted and might be construed as intrusive, such as email spam. The internet has allowed everybody the potential to be a publisher, and the ability to communicate with a vast audience through numerous channels including emails, websites, chat systems and newsgroups (Melewar and Smith, 2003). They also cite that the internet is a new avenue for political action, which in turn makes the internet a breeding ground for controversy. It is hard to imagine that tennis would evoke such emotion as that engendered by organisations such as McDonalds whose “anti” website www.McSpotlight.com is a sizeable site with considerable content and potentially a significant user base. The main concern is that all marketing and communications are done with a consideration for Corporate Social Responsibility (CSR). Unfortunately, CSR does not have clear definition (Frankental, 2001) but aspects, such as high levels of emails, pop-ups and texts would fall into this category, and this would almost certainly contravene the Data Protection Act 1988 or the Privacy and Electronic Data Communications Regulations 2003.

Consumer Privacy

Regardless of the Data Protection Act, which provides legislation about what data can be held on the individual by organisations, there is a general concern about the technological advances which allow this personal data to be collected about an individual. Individuals do not believe that marketers are concerned with consumer privacy issues, and they have negative perceptions of companies which attempt to record too much personal information (Graeff and Harman, 2002). Consumer concern also extends not only to how the data is used internally within an organisation, but also how that data may be used by other parties, either officially with the consumer’s knowledge, or unofficially or illegally without the consumer’s
knowledge. There is a considerable black market for email distribution lists, and more so for email accounts that are known to be active.

7.9. Implementation Scope

Section 6.2.5 on page 159 discussed the categorisation of the systems in use by the operational organisations that were referenced as part of the qualitative research. This established three broad levels of usage: The first was little or no systems usage; the second was the use of standalone Microsoft Office applications (Word, Excel as examples); and the third was the package solutions typically in use by organisations with a larger user base than the previous two categories. This categorisation assists in answering the question as to the extent to which an ERP system can be implemented in an environment.

The first category of little or no systems usage would seem an ideal candidate for such a system. The two examples cited in the category were firstly where councils had no booking system in use at all. They would be able to use a centrally based booking system which allowed the council concerned to make it appear as if they had a dedicated system (discussed in section 7.1). Secondly, there was an example of the private tennis club which did not use the Microsoft Office toolset, which would also be an ideal candidate for a centrally based membership system, including the use of other modules discussed previously.

The second major category was the group which primarily used the Microsoft Office based toolset. Whilst Office products offer significant functionality they are not integrated and need to be developed and customised for use. The opportunity, therefore, is for a centrally based membership system to be offered which would give the functionality “out of the box” required to run a tennis club or tennis section of a larger organisation. This could also include additional modules such as online booking, as discussed previously, financial recording and reporting, plus tournament software.

The third category presents a larger challenge. This is where organisations have already implemented an integrated system to some level or other. Organisations in this category may not want or be able to swap systems easily due to the investment in time and money already expended in to their existing implementation and also the effort of evaluating a new alternative. There may also be issues with integration into existing systems that would be out of scope for an implementation with is focused primarily on the tennis-playing aspect. This would be more prevalent with councils in a multi-sport leisure environment. However, as with
the first category, if there are organisations with “gaps” in their integrated system portfolio, such as online booking and tournament software, then the opportunity exists for councils and clubs to be able to fill the gap with modules from the central system proposed.

It should be pointed out that the research method selected sought to investigate the use of an ERP framework within the landscape of British Tennis and to address the question as to what extent such a framework could be applied. It is not a qualitative survey into which organisations fall into which category and therefore would be suitable candidates for such a system. This would need to be the subject of further investigation.

7.9.1. Summary

There is considerable scope for the implementation of an ERP system in the central organisation of the LTA. Having an integrated solution for the systems identified is certainly within the capability of modern ERP systems with additional customisations. Areas of customisations would include the tournament and ratings areas, which are highly specialised and niche solutions which would not be available as an off-the-shelf solution from other vendors.

Modern network capability makes the connectivity of the modules up and down the value network an option which would provide data and functionality to all organisations. This also provides the concept of Software as a Service (SaaS) – something that would be very beneficial to the smaller clubs with fewer funds and volunteers than the larger clubs.

There are a number of concerns that need to be addressed before an implementation of this sort could be attempted. Apart from any funding and cost issues, the experience of the take-up of Totaltennis provides a number of valuable lessons in order to ensure success in future implementations of the nature. Areas would include project management, management commitment and training, and other areas identified as part of the CSFs discussed earlier, which are vital to a successful ERP implementation.
Chapter Eight: Conclusions

8.1. Introduction

Overall this research shows that the opportunity for the LTA to adopt a large-scale system based on ERP technology has considerable benefit. This would help the LTA to meet its objectives of more players in the top 100 internationally ranked players by improving the communication to existing and new members, attracts more people to the game, and improving competition, and thereby the overall standard of British Tennis. This is not a short-term strategy and is not an inexpensive exercise, but the level of technological innovation needs to be improved significantly to help all parties reach their goals. Failure to do so will see British Tennis relegated to the lower divisions of the Davis Cup and the first round of Wimbledon for many years to come.

Additionally, the model demonstrates that an extended distributed model can be implemented into this sport environment and also the model could be applied to other sports, and other environments, where a mixture of public, private, government and commercial organisations are linked together in an extended value chain.

8.2. Research Questions Conclusions

8.2.1. Conclusions for Research Question One

Critically evaluate the organisations involved in the provision of British Tennis using primarily value chain as a framework and thereby establish the efficacy of their interrelationships.

What the research has shown is that there are a large number of independent organisations involved in the provision of tennis in Britain, including private, public and charitable trusts. There is no single point of ownership and each of the organisations has independent decision-making processes. There were two points raised by Slack (1997) which were the issues of centrality and the decision-making process. These identify the issues about the power and politics in sport which are shown to be very relevant to the discussion about the value chain and value network of the tennis environment. Taking the headings in turn:
i) Control over the decision-making process: this is probably the biggest issue that the LTA and any potential framework have to contend with. The LTA does not own (with the exception of the regional LTA) or control downstream organisations, therefore it cannot dictate the use of systems. Similarly, it does not control the budgets of the organisations of which IT spend would be part and therefore any systems or ERP purchase could only at best be a recommendation. The challenge therefore is to make the proposition for an ERP framework as compelling as possible and to reach a critical mass of usage and become a de facto standard in the same way that modern social networking websites have become.

ii) Centrality: The redrawn value chain (Figure 13 on page 138) highlights the LTA as being central to the control of information and strategy formulation. It is also the central point where the cutover from strategy to operations is first identified. Organisations “below” the LTA in the hierarchy could either use systems supplied or supported by the LTA or an ERP framework.

Although they don’t own the decision-making process, the LTA has the strength of the centrality and also the credibility, being the National Governing Body, which gives it the “clout” to be able to influence strongly. What the LTA will need to be able to do is demonstrate the value creating ecology whereby they are not providing information to consumers but providing the systems infrastructure to be able to become co-creators of value across the value network. Hearn et al. (2006) point out that the process should not just be a linear view but a holistic, dynamic view, and this can be developed by providing a strategic framework which provides personalised information and a portal for the end user, whether that is a club, council or casual tennis player. The framework allows for access via extended networks by Internet, VPN or static line for the larger organisations, to provide a proposition for collaborative networking, in which data can be shared across multiple organisations (with the proper security controls) in order to create an extended value network.

8.2.2. Conclusions for Research Question Two

Critically evaluate the organisations and electronic systems in use today to determine the effectiveness in achieving their objectives.
The use of systems varied enormously across the organisations contacted. It varied from the high-end ERP systems in the larger organisations through to no use of IT by the smaller entities. There was no system that spanned all the organisations and the only system that had attempted it had failed (Totaltennis). The picture, therefore, is one of opportunity.

Shang and Seddon (2002c) listed a large number of benefits in their study and the principles of a subset of these can be applied to this research as listed below:

- Reducing labour costs in running a single system that supports many users, as opposed to many systems.
- Reducing cycle time for tournament/ratings and rankings.
- Enabling e-commerce to attract new customers and expand into new markets.
- Improving the cost effectiveness of the IT infrastructures via an SaaS framework.
- Building a common vision. The idea of having a single system to support and maintain the operational player base of all the clubs would allow a single vision as an objective and would obviate the need for clubs to research, select and install their own systems.

Large organisations use high-end ERP systems for mass marketing and new and modern methods of analysis and communication to target audiences and to make electronic communication more personalised, as opposed to blanket advertising. In a similar way that Tesco classifies its Clubcard members into categories by their buying patterns, so too can the LTA categorise its customers and consumers into subgroups and provide more targeted marketing information. By providing a membership system, financials, online booking and communications facilities, e.g. email and SMS, information can be gathered and analysed and the resultant information used to promote events and activities. These facilities can also be used to improve club productivity for the volunteers within the organisation. At a council level the opportunity to interface with a central system would be of considerable value to enable them to offer extended facilities which they are not able to offer today. It also allows more data to be collected about the people playing on the courts and therefore to improve and promote the game further.

8.2.3. Conclusions for Research Question Three

To what extent can an ERP system be implemented in a public and private multi-organisational model?

Research Question Three covers the proposal for a framework, detailed in Chapter Seven, based on integrated ERP systems that will improve the quality and reach of the existing
systems. In this environment there are considerable challenges to provide quality systems, but the basic building blocks are already available from a number of software vendors who provide integrated database systems and who are improving the network and communications access on a frequent basis to meet the demands of the commercial world. Research Question Three puts forward a framework proposal based on the work of Porter’s Value Chain (reference Figure 18: Value Chain Model updated for the LTA Framework), and allows this to be extended further along the value network to other organisations, and from there to individual consumers who want to improve their game or just play socially. This also extends from the top players to the ‘Sunday afternoon’ players who ‘spend more time picking up the balls than they do playing rallies’.

Research Question Three also presents a very simple data schema showing the possible options for a membership-based system on an SaaS model similar to the Salesforce.com commercially available application. This facility creates a win-win situation for both parties in the value chain. The clubs have a membership system which should offer increased function, such as direct debit, higher subscription levels, payment offerings and dunning letters. In return, the LTA can capture information on the demographics of the players at the organisation, plus it now has important information for marketing and CRM purposes.

The use of an extended network model means that there is the opportunity for data to be made available and accessed by a far greater audience and extended organisations. This would include schools and universities who, although they would have no use for membership and online booking, would benefit from access to tournament software and results.

Other considerations need to be taken into account. User involvement is vital, as a project that is run purely by the IT team is doomed to failure. It needs buy-in and commitment from the senior management team; it needs excellent project management skills; and it needs awareness of other issues such as privacy laws, brand protection and data protection.

This framework supports the government strategic objectives of improving the standard of play, utilising technology to provide more and better information to the managing organisations so they can target their audience more effectively, and also for the players to be offered more opportunity to play. The other government objectives are concerned with improving the health of the nation by promoting exercise for all. The government paper (National Strategy Unit, 2002) discusses the health aspects and points out that there is a strong
systematic evidence of a direct link between regular physical activity and improved health for all ages – a 10% increase in adult activity would prevent around 6,000 premature deaths per annum. As they point out, the most sedentary groups will gain the most from a small rise in activity; tennis can be a high-energy aerobic workout and it can also be a gentle exercise for those who wish to play that way.

The report also highlights the need for simplified structures in order to improve delivery, reduce bureaucracy and ensure that the money reaches the sport. Most importantly, the report specifically states that “many management systems could be improved”. (National Strategy Unit, 2002). This framework would improve the fragmented approach that exists within the sport currently, and could also be applied to other sports and National Governing Bodies.

8.2.4. Implications

The implication of this research is that the LTA could implement a large-scale ERP system, as proposed, that would enable greater functionality, centralised information and extended access by organisations and people. These are two of the three categories identified, shown in section 7.9, where a centrally based system could be utilised with opportunities identified in the third category as well. This ERP system would support the principal functions required by the LTA, and where specialised modules are required, e.g. Tournament Software, then this should be purchased as a best-of-breed software package, or the functionality developed as customisations and extensions to the main package. There would seem little benefit in developing bespoke equivalent function in a new ERP system due to the potentially high cost of development. Therefore, the alternative would be to develop an XML interface, for instance, to allow data to be quickly and easily shared with a central system.

The project to implement such a system would be a large undertaking and the deliverables would need to be phased, by a combination of business benefits and setting the infrastructure.

There are many variables involved in preparing a detailed implementation plan and this aspect alone can take many man-months to prepare and agree upon, depending on the package selected, the existing legacy systems and the benefits that are to be expected by implementing the framework. In the author’s experience of implementing and managing IT and ERP systems, the following implementation phasing would form a good basic implementation plan,
including a review of existing systems, the selection of an ERP software vendor, and then the implementation phases. These are specifically staged in this way to enable the functional infrastructure to be built prior to opening up the systems in stage 3 to external use. Phase 3 and phase 4 could be swapped if it was felt that it was more beneficial to implement the ratings and rankings component earlier.

The order of implementation then is as follows:
1) Audit of existing systems and functionality internally and with key partners
2) Selection of an ERP framework
3) Phase 1 – implementation of the finance modules and XML support
4) Phase 2 – implementation of the CRM components and support.
5) Phase 3 – Implementation of a club website, membership plus other club support components
6) Phase 4 – implementation of the ratings and rankings input, calculation and publishing

8.3. Testing the Framework

Given the size and number of organisations involved it is not possible to test the ERP framework within the DBA research. Therefore, in order to test the model as proposed it is necessary to find a similar proposition. The method of doing this is to apply the model to a smaller subset of the organisational hierarchy and review the “fit”.

Testing the implementation of the model for phase 1 (Finance) and phase 2 (CRM) is standard ERP module functionality and can be found in any number of organisations. Examples of ERP finance implementations can be found at companies in the public and private sectors such as Tesco, Interflora, Nestlé and Oxford University. The establishments quoted have implemented differing ERP solutions from different vendors but would involve a similar implementation to the model for the LTA. The reasoning behind this phasing is that it gives the basic infrastructure on which to build the other modules. The financial element gives a full and clear picture of all costs of the organisation (typically a finance implementation would include General Ledger, Accounts Payable, Accounts Receivables, Fixed Assets and Cash Management) and allows this data to be used as part of the integrated system in the later stages. Creating the CRM framework as part of phase 2 lays the foundations for the infrastructure to collect and analyse the data from the later stages, and in itself could be used to start generating marketing campaigns from existing contact data which can generate additional revenue.
For phase 3 (Sports Club support), there is a private software development company that currently markets an online solution to sports clubs. For the purposes of the study they will be referred to as Sportcom. Sportcom started in 1998 and recognised that there was a market opportunity for software specifically to help tennis clubs in the management and administration of the club. Their initial offering was a product based on a Microsoft Access database which allowed improved management of membership, including improved management of subscriptions, accounting and VAT. This was successful in a number of local clubs but was a difficult model to support. This was because any software update had to be sent out either via CD or by means of a site visit. Equally, if there was a change to the database structure then a support analyst would need to visit the site and take a copy of the data. This data would then need to be restructured and then re-imported to effect the change. This was time-consuming and not cost-effective.

Sportcom then changed their strategy to develop an online solution. The new model had a central database based on MySQL, and they developed products written in PHP and HTML. The first product was a rewrite of the membership system in the new online architecture. This allowed them to promote the idea that there was now far greater access to the system and, coupled with an updated security matrix, ensured that people only had access to their part of the data.

Having an online proposition enabled Sportcom to further develop its online offering. The additional modules that were developed were:
- to improve contact to the membership via email and SMS texting;
- to allow online booking for facilities, e.g. tennis courts;
- to provide an online shop facility which can sell equipment or branded goods e.g. T-shirts and sweatshirts with the club logo; and
- to provide a basic website facility with content management and update software in order to allow club officials to update the website themselves

The five modules (membership, contact, booking, shop and web) were then bundled into a package for clubs. Due to the integrated nature of the solution, there was a significant discount if the club bought all five modules. This was not just a marketing proposition, as it was easier to implement and support if all modules were fully populated. For instance, it is possible for clubs to buy the contact module without any other modules. However, if they also
purchased the membership module, then when new members were added to the system their contact information was automatically added to the contact module. This is because there is a single set of tables that contains customer and address information. This also holds true for the shop module and the court booking module. The customers’ information is the same for all modules, so if they sign up for one, then the system will recognise them for other areas as well. This integrated nature of the ERP systems is one of the most important and beneficial aspects of the system.

Figure 25 shows a modified version of Figure 19 in the previous chapter. The components in red highlight the parts that the Sportcom systems support, with the five modules discussed. The differences are that the central hosting is done via the hosting facilities within the Sportcom domain and not via the LTA, and that they are really only interested in the Club market at present, although they recognise that the tournament area of the tennis market offers a significant business opportunity and are investigating this area.

Phase 4 (ratings and rankings) can equally be built on the Sportcom model as it is an extension of the access to the boxes marked players, elite players and tournament organisers. There are no special connectivity requirements to these groups, and it is therefore a functional development that can be added to the database.
Earlier in the thesis there was a discussion concerning SaaS (Software as a Service). The company would not host any part of the service and the SaaS company would charge on a per user, or even a per transaction, basis. This works very effectively for areas such as payroll. This model is perfectly feasible for some of the transactional components of the system but does mean that the LTA would need to consider outsourcing its IT operation to other companies. Another model of outsourcing is where a company, such as Sportcom, could change its business model and, instead of selling its service to clubs, it would host the service on behalf of the LTA and they would market it as a service to its members e.g. the affiliated tennis clubs. This model would seem to have significant benefits on both sides as it allows the LTA to provide a service to its club at no or nominal cost, and Sportcom can focus on providing an improved functionality and support model without having to worry about the sales and marketing aspects. This discussion of the LTA running the system in-house as opposed to being outsourced is dependent on costs and the long-term strategic resourcing plan of the LTA.

Whichever model is used (the current, the SaaS model or full outsourcing), Sportcom have proved that a subset of the framework as proposed by this research is a model that both works and is commercially viable to provide functionality to British tennis clubs. Extending the model, which they are investigating, also goes further to verify the flexibility and functionality that the framework allows, and can be built on to provide additional processes and modules that complement and build on the existing system.

8.4. Limitations of the Study

As with any research there will be limitations to what can be achieved, whether this is due to cost, time and/or access, plus any other myriad of factors that may come into play to constrain the researcher in their goals. This said, appreciating the limitations can enable a more insightful understanding of the principles and issues under investigation.

The research was carried out with a number of respondents involved in the delivery or strategic delivery of tennis within England. This included respondents who worked in the industry, consultants and, as discussed previously, a number of volunteers who run clubs or parts of clubs. As with all interviews, it very much depended on the respondents’ willingness to participate, and some people did decline to be part of the study. Some didn’t believe they had anything to contribute as they were not responsible for the systems under discussion, their usage was only therefore as a user, and they referred the researcher to the LTA. Although it
was pointed out that the absence of a value (Strauss and Corbin, 1998) or usage of the system in this case was as important as actual usage, they did not feel inclined to participate. The second area that has proved a limiting factor in the research is the fact that the LTA has been going through a major reorganisation and a completely new management team has been put into place. As a result of this a number of initiatives and strategic directions are under review and certainly one respondent was unable to comment on ongoing systems and usage.

Disappointingly, one of the larger public private initiatives which runs about 130 centres in the UK on behalf of local councils did not even reply to a written request for information. Also, they do not publish a telephone number for their head office and, unfortunately, they do not fall under the Freedom of Information scope and therefore it was not possible to include them in the research.

However, the respondents who did respond were from a wide range of aspects of the sport and their comments were able to be validated against each other in order to improve the reliability and validity of the data collected.

All respondents had explained to them the data anonymity and confidentiality aspects of the research. One respondent declined to comment about one aspect of a specific question as it formed part of the business plan to the company, however this was exceptional and most respondents were very open. One respondent was quite vocal about some organisational aspects and it is entirely possible that this was due to their being refused a grant for building works by another of the organisations under review. This bias was recognised and the respondent’s comments assessed in light of that view.

The method of open coding in content analysis is widely accepted, but could be open to manipulation, either consciously or unconsciously by the researcher, and therefore the dual techniques of open and axial coding and the use of experienced researchers to verify the coding addresses this issue. The external review of a varied sample of respondents by an independent expert means that any unintentional bias should be reduced.

8.5. Summary of Contributions to Knowledge

ERP systems are still evolving as technology and business strategy and organisation evolve. This thesis adds to the contribution to knowledge in three principal areas. These are specifically: demonstrating how the SaaS model can be used in an extended network of
organisations in a way that has not been researched or investigated previously; the use of the extended value chain in an environment which is a mixture of public and private companies, commercial and non-profit organisations and no single body with overall responsibility; and also investigation how the power and politics within sport are applicable to ERP and IT implementations.

8.5.1. Extended Value Chain

Porter’s model initially focused on the product value chain as opposed to a service-based value chain. There has since been academic literature concerning the service aspects of the value chain and examples include tourism (Yolmaz and Bititci, 2006). There have also been investigations into the use of external networks which extend the value chain model which relate to the management and interaction of external networks that could include firms, governments, customers as examples (McPhee and Wheeler, 2006).

This research investigates the use of a services value chain in the form of the provision of tennis from government departments through to the delivery of tennis via clubs, councils and commercial ventures. It also investigates the extended network aspects of the value chain with regard to the service value chain, and it does it in an area where there is paucity of research. The organisations involved included government agencies and commercial organisations, commercial and not-for-profit organisations, as well as a diversity in the size and structure of organisations. This structure and diversity is likely to be similar in other sports within the UK and it also may be applicable to other sectors where the government and private sectors interact. This might include charitable organisations or health care as potential examples.

The contribution of the research, therefore, is a map of the extended value chain in a sports environment which highlights the linkages between both public and private organisations, which could be then extended to reflect other sectors. This work also extends the value chain research into an area where it has not previously been researched.

8.5.2. Extending the Software as a Service to an Extended Network of Organisations.

This research takes the SaaS model and extends it further. ASP models offered a number of service/product portfolios. Some offered “out of the box” ERP solutions, which
meant that SMEs did not need to invest in large infrastructure and capital outlay. Others focused on collaboration tools (email, calendaring, etc) and others on vertical industry applications, of which examples include health care and finance.

Specifically where the framework differs is that the LTA own and manage the service and have access to the data and information held within the hosted applications entered by the clubs or councils with the relevant people's agreement. This framework, if not unique, is very unusual. Most SaaS providers would not be able to use any data that is being collected by its clients and would be specifically restricted from doing so. The principle of this implementation is that the LTA would be able to deliver a service to its client organisations across the value chain and effectively in exchange it would be able to analyse the data for its own marketing and management purposes. This model is certainly transferable to other sporting organisations where there is a governing body that could then further analyse data across a large number of organisations. It could also be transferred to other industries or organisations where there is a parent body, i.e. they provide the service and provide a central hosting environment and it looks to the client organisations as if they have their own environment whilst the central organisations have access as well.

8.5.3. Power and Politics in Sport and Systems Implementation issues.

A number of academic articles focus on ERP implementation issues (Bingi et al., 1999, Kraemmergaard and Møller, 2000, Parr and Shanks, 2000, Huang and Palvia, 2001, Al-Mashari and Al-Mudimigh, 2003, Amoako-Gyampah, 2004) whilst Slack (1997) focusses on the politics and power issues of sports and sports clubs and organisations. The areas where the two research areas overlap would highlight the areas where ERP implementation issues would most be at risk in this framework. This analysis has not been done before and gives a new perspective on issues surrounding ERP systems implementation into sports environments.

8.6. Directions of Future Research

There are a number of areas where future research would add greater depth to the subject area of sport or ERP systems. These include:

- A large-scale quantitative survey would enable a wider audience to be reached to identify suitable organisations that would be able to utilise and implement a system which is proposed. Indeed, conducting the research using some of the access methods
discussed in Research Question Three would, in itself, provide evidence of the effectiveness of the recommendations.

- The IT and communications world is moving at a considerable pace and it is certain that a number of innovations that are still in their infancy may change the reach and scope of access to the potential tennis-playing public. Whilst this research has tried to balance new techniques with those that have been tried and tested, it is entirely possible that in the next eighteen months the landscape will have changed and what was not possible today is a real possibility in the future.

- The use of the SaaS model has not been highly researched and the use of this framework across different software functionality and across different user bases is something that is likely to gain in popularity due to technical advances in network technology and the low cost of use by the end user and low cost of set-up infrastructure. The implementations issues and operational issues will be different and it is important to understand the new paradigm in systems usage.
8.7. **Summary**

Each of the three research questions have now reached conclusion.

The landscape of British Tennis has very simple objectives: Firstly, to get more players into the international top rankings; secondly to get more players involved in the game at all levels; and thirdly to improve the health of the nation by getting people off the settee and out onto the courts. Currently the number of organisations which are owned and managed independently causes significant difficulties when discussing integrated systems up and down the value chain. Although independent organisations need not necessarily be a barrier to integrated systems, when these organisations are also run by volunteers it is clear what a steep hill the LTA and regional LTA have to climb to achieve any objectives and initiatives. However, there is precedent in the activity side of the business with the Mini Tennis initiative and on the technical side with the Totaltennis website, which show that it is possible to roll out successful initiatives and encourage take-up of technical solutions. Therefore, the premise is that an integrated framework offers additional function. This, in turn, offers the central organisation increased marketing and CRM information plus more detailed demographic and customer information. Having this framework with increased network and technology access will also set the framework to be able to tackle the issue of how to reach the large numbers of casual players to encourage and promote the game further.

This research also contributes to knowledge in the use of the value chain to model an ERP system across an extended network in public and private organisations and also across a mixture of commercial and not-for-profit organisations. This model can be utilised by other industries and models where the value chain crosses multiple organisations.
Appendix A: Interview Respondents

Listed below is the range and expertise of the respondents interviewed, Table C.1 below presents their credentials anonymously.
<table>
<thead>
<tr>
<th>Respondent</th>
<th>Type of Company</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>LTA Tennis Consultancy</td>
<td>Consultant. Womens top 4 English player.</td>
</tr>
<tr>
<td>02</td>
<td>Russell University</td>
<td>Head of Sports</td>
</tr>
<tr>
<td>03</td>
<td>Private Tennis Club</td>
<td>Club Official</td>
</tr>
<tr>
<td>04</td>
<td>Inner City Tennis Initiative</td>
<td>MD</td>
</tr>
<tr>
<td>05</td>
<td>Private Tennis Club</td>
<td>LTA Coach</td>
</tr>
<tr>
<td>06</td>
<td>Regional LTA</td>
<td>Chairman</td>
</tr>
<tr>
<td>07</td>
<td>Affiliate Sports Organisation (IRLM)</td>
<td>Managing Director</td>
</tr>
<tr>
<td>08</td>
<td>Regional Sports Partnership</td>
<td>Director</td>
</tr>
<tr>
<td>09</td>
<td>Senior IT Director</td>
<td>Director</td>
</tr>
<tr>
<td>10</td>
<td>Local Council/Private Initiative</td>
<td>Coach</td>
</tr>
<tr>
<td>11</td>
<td>Regional Hub Tennis centre</td>
<td>Coach</td>
</tr>
<tr>
<td>12</td>
<td>Local Council/Private Initiative</td>
<td>Court Booking Staff</td>
</tr>
<tr>
<td>13</td>
<td>Local Council</td>
<td>Court Booking Staff</td>
</tr>
<tr>
<td>14</td>
<td>Private Tennis Club</td>
<td>Club Official/LTA registered coach.</td>
</tr>
<tr>
<td>15</td>
<td>Regional LTA</td>
<td>Club Development Officer</td>
</tr>
<tr>
<td>16</td>
<td>Government Agency</td>
<td>Government Marketing Officer</td>
</tr>
<tr>
<td>17</td>
<td>Private Tennis Club</td>
<td>Club Official</td>
</tr>
<tr>
<td>18</td>
<td>Local League Organiser plus club committee member</td>
<td>Secretary and Club Development Officer</td>
</tr>
<tr>
<td>19</td>
<td>Independent Coaching Company</td>
<td>Independent coach</td>
</tr>
<tr>
<td>20</td>
<td>Private Tennis Club</td>
<td>Club Official</td>
</tr>
<tr>
<td>21</td>
<td>Local Education Authority</td>
<td>Development officer responsible for tennis.</td>
</tr>
<tr>
<td>22</td>
<td>Top 32 World Ranked Junior</td>
<td>Performance Player</td>
</tr>
<tr>
<td></td>
<td>Private Tennis Club/Mini Tennis club manager</td>
<td>Mini Tennis Manager and Organiser</td>
</tr>
<tr>
<td>---</td>
<td>---------------------------------------------</td>
<td>-----------------------------------</td>
</tr>
<tr>
<td>24</td>
<td>Sports Software Development Company</td>
<td>Managing Director</td>
</tr>
<tr>
<td>25</td>
<td>Spokesman (written response)</td>
<td>LTA</td>
</tr>
<tr>
<td>26-29</td>
<td>Not assigned</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Private Tennis Club</td>
<td>Club Official</td>
</tr>
<tr>
<td>31</td>
<td>Private Tennis Club</td>
<td>Club Official</td>
</tr>
<tr>
<td>32</td>
<td>Local Council</td>
<td>Council Representative</td>
</tr>
<tr>
<td>33</td>
<td>Local Council</td>
<td>Council Representative</td>
</tr>
<tr>
<td>34</td>
<td>Local Council</td>
<td>Council Representative</td>
</tr>
<tr>
<td>35</td>
<td>Local Council</td>
<td>Council Representative</td>
</tr>
<tr>
<td>36</td>
<td>Local Council</td>
<td>Council Representative</td>
</tr>
<tr>
<td>37</td>
<td>Local Council</td>
<td>Council Representative</td>
</tr>
<tr>
<td>38</td>
<td>Local Council</td>
<td>Council Representative</td>
</tr>
<tr>
<td>39</td>
<td>Local Council</td>
<td>Council Representative</td>
</tr>
<tr>
<td>40</td>
<td>Local Council</td>
<td>Council Representative</td>
</tr>
<tr>
<td>41</td>
<td>Private Tennis Club</td>
<td>Club Official</td>
</tr>
<tr>
<td>42</td>
<td>Local Council</td>
<td>Council Representative</td>
</tr>
<tr>
<td>43</td>
<td>Local Council</td>
<td>Council Representative</td>
</tr>
<tr>
<td>44</td>
<td>Private Tennis Club</td>
<td>Club Official</td>
</tr>
<tr>
<td>45</td>
<td>Local Council</td>
<td>Council</td>
</tr>
<tr>
<td></td>
<td>Name of Organization</td>
<td>Position</td>
</tr>
<tr>
<td>---</td>
<td>---------------------</td>
<td>----------</td>
</tr>
<tr>
<td>46</td>
<td>Local Council</td>
<td>Council Representative</td>
</tr>
<tr>
<td>47</td>
<td>Local Council</td>
<td>Council Representative</td>
</tr>
<tr>
<td>48</td>
<td>Local Council</td>
<td>Council Representative</td>
</tr>
<tr>
<td>49</td>
<td>Local Council</td>
<td>Council Representative</td>
</tr>
<tr>
<td>50</td>
<td>Local Council (hosts large Tournament)</td>
<td>Council Representative</td>
</tr>
<tr>
<td>51</td>
<td>Regional LTA</td>
<td>CDO</td>
</tr>
<tr>
<td>52</td>
<td>Regional LTA</td>
<td>CDO</td>
</tr>
<tr>
<td>53</td>
<td>Private Multi Sports Club</td>
<td>Club Official</td>
</tr>
<tr>
<td>54</td>
<td>Local Council</td>
<td>Council Representative</td>
</tr>
<tr>
<td>55</td>
<td>Private Tennis Club</td>
<td>Club Official</td>
</tr>
<tr>
<td>56</td>
<td>Local Council</td>
<td>Council Representative</td>
</tr>
<tr>
<td>57</td>
<td>Local Council</td>
<td>Council Representative</td>
</tr>
<tr>
<td>58</td>
<td>Local Council</td>
<td>Council Representative</td>
</tr>
<tr>
<td>59</td>
<td>Private Tennis Club</td>
<td>Club Official</td>
</tr>
<tr>
<td>60</td>
<td>Regional LTA</td>
<td>CDO</td>
</tr>
<tr>
<td>61</td>
<td>Private Tennis Club</td>
<td>Club Official</td>
</tr>
<tr>
<td>62</td>
<td>Local Council</td>
<td>Council Representative</td>
</tr>
<tr>
<td>63</td>
<td>Local Council</td>
<td>Council Representative</td>
</tr>
<tr>
<td>64</td>
<td>Local Council</td>
<td>Council Representative</td>
</tr>
<tr>
<td>65</td>
<td>Local Council</td>
<td>Council Representative</td>
</tr>
</tbody>
</table>

**Table A-1: Anonymous List of Respondents’ Credentials**

Page 224
Appendix B: Enterprise system benefit framework (Shang and Seddon, 2002c)

1. Operational benefits

1.1 cost reduction
- Labour cost reduction in customer service, finance, human resources, purchasing, IT services and training.
- Inventory cost reduction in inventory turns, dislocation costs and warehousing costs.
- Administrative expenses reduction in printing and other business supplies.

1.2 Cycle time reduction
Measurable cycle time reductions in three kinds of activities that supports customers, employees and suppliers.

- Customer support activities in order fulfilment, billing, delivery and customer enquiries.
- Employee support activities in month-end closing, requisition, HR and payroll and learning.
- Supplier support activities in order processing, information exchanging and payment.

1.3 Productivity improvement
- Production per employee, production per labour hours, production per labour costs, increased work volume with same work-force and reduced overtime.

1.4 Quality improvement
- Error rate, data reliability to data accuracy

1.5 Customer service improvement
- Ease of data access and inquiries
2. Managerial benefits

2.1 Better resource management

- Better asset management for improved cost, depreciation, relocation, custody, physical inventory and maintenance records control, both locally and worldwide.
- Better inventory management in shifting products where they were needed and responding quickly to surges or dips in demand. Managers able to see the inventory of all locations in their region or across boundaries, making possible a leaner inventory.
- Better production management for co-ordinating supply and demand and meeting production schedules at the lowest cost.
- Better workforce management for improved workforce allocation and better utilisation of skills

2.2 Improved decision making and planning

- Improved strategic decisions for greater market responsiveness, fast profit analysis, tighter cost control and effective strategic planning.
- Improved management decisions for flexible resource management, efficient processes and quick response to operation changes.
- Improved customer decisions with flexible customer services, rapid response to customer demands and prompt service adjustments.

2.3 Performance improvement in a variety of ways in all levels of the organisations

- Financial performance by lines of business, by product, by customers, by geographies or by different combinations.
- Manufacturing performance monitoring, prediction and quick adjustments.
- Overall operational efficiency and effectiveness management.

3. Strategic benefits

3.1 Support business growth

- In transaction volume, processing capacity and capability.
- With new business units.
- In products or services, new divisions or new functions in different regions.
- With increased employees, new policies and procedures.
In new markets.
With industry’s rapid changes in competition, regulation and markets.

3.2 Support business alliance by
- Efficiently and effectively consolidating newly acquired companies into standard business practice.
- Building consistent IT architecture support in different business units.
- Changing selling models of new products developed by a merged company.
- Transiting new business units to a corporate system.
- Integrating resources with acquired companies.

3.3 Building business innovation by
- Enabling new market strategy.
- Building new process chains.
- Creating new products or services.

3.4 Building cost leadership by
- Building a lean structure with streamlined processes.
- Reaching business economics of scale in operation.
- Shared services

3.5 Generating product differentiation by
- Providing customised product or services, such as early preparation for the new EMU currency policy, customised billing, individualised project services to different levels of service appropriate for various sizes of customer organisations.
- Providing lean production with make-to-order capabilities

3.6 Enabling worldwide expansion with
- Centralised world operation.
- Global resource management.
- Multicurrency capability.
- Global market penetration.
- Cost-effective worldwide solution deployment.
3.7 Enabling e-commerce by attracting new customers or getting closer to customers through the web integration capability. The web enabled ES provides benefits in business to business and business to individual in:

- Interactive customer service.
- Improved product design through customer direct feedback.
- Expanding to new markets.
- Building virtual corporations with virtual supply and demand consortia.
- Delivering customised service.
- Providing real-time and reliable data enquiries.

3.8 Generating or sustaining competitiveness

- Maintaining competitive efficiency.
- Building competitive advantage with quick decision making.
- Staying ahead of competitors for better internal support.
- Using opportunities generated by ES to pull abreast of world leaders by using the same software and being compatible with customers.

4. IT infrastructure benefits

4.1 Building business flexibility by rapid response to internal and external changes at lower cost and providing a range of options in changing requirements.

4.2 IT cost reduction in:

- Total cost of maintaining and integrating legacy systems by eliminating separate data centres and applications, as well as their supporting costs
- IT staff reductions
- Mainframe or hardware replacement
- System architecture design and development
- System upgrade maintenance
- System modification and future changes
- Technology research and development

4.3 Increase IT infrastructure capability
Stable and flexible support for the current and future business changes in process and structure.

Stability:
- Reliable platforms
- Global platforms with global knowledge pipeline
- Transformed IS management and increased IS resource capability
- Continuous improvement in process and technology

Flexibility:
- Modern technology adaptability
- Extendibility to external parties
- Expandability to a range of applications
- Customisable and configurable

5. Organisational benefits

5.1 changing work patterns with shifted focus
- Co-ordination between different interdisciplinary matters
- Harmonisation of interdepartmental processes

5.2 facilitating business learning and broaden employee skills
- Learned by entire workforce
- Shortened learning time
- Broadened employee skills
- Employees with motivation to learn the process

5.3 Empowerment
- Accountability, more value-added responsibility
- More proactive users in problem solving, transformed from doers to planners.
- Working autonomously
- User with ownership of the system
- Greater employee involvement in business management

5.4 Building common visions
• Acting as one and working as a common unit
• Consistent vision across different levels of organisation

5.5 shifting work focus
• Focus on customer and market
• Focus on business process.
• Focus on overall performance

5.6 increased employee morale and satisfaction
• Satisfied users with better decision making tools
• Satisfied users with increased work efficiency
• Satisfied users with solving problems efficiently
• Satisfied users with increased system skills and business knowledge
• Increased morale with better business performance.
• Satisfied employees for better employee service.
Appendix C: Sample Interviews

INTERVIEW: PRIVATE LAWN TENNIS CLUB: Club Official

Legend: **Bold Red** – Core question  
**Bold Blue**- Probe or follow-up question  
*Italic*: Coded statement  
Footnote: Statement coding category.

[Preamble excluded from transcript. It includes a personal introduction, confidentiality and permission to record the conversation]

**Can you describe your role and the organisation please?**

The tennis club purely …lawn tennis club has been in existence for about 25 years, 30 years maybe. We have about a total of about 225 members⁸ which includes juniors. We have our own club with 6 tennis courts⁹, we have a committee which is…an elected committee of about 10 people and I am the honorary secretary for the tennis club and I’ve been that for 2 years.

**Do you have Floodlights?**

Yes, they are all floodlit.

**What is the ownership structure of the club?**

The ownership of the club is, well it’s a little bit complicated it’s, the constitution is that of an ordinary tennis club but we also have a limited liability company which is called XXX Tennis Club and that’s because we lease our grounds from YYY District Council on a 30 year lease and they required us to have a constitution of a company in order to give us this long lease, so that’s just a practical matter, but in reality we’re like any other club we have a

---

⁸ Clubs  
⁹ Clubs
annual general meeting once a year and anybody who is a paid up adult member of the club can vote for the officers.

I have a list of systems here and I would like to run through my list with you to understand whether you have a system and if you do how you use it.

Memberships system?

The membership system, we have a membership secretary and every month of the year in April or March as the tax year runs from the 1
\textsuperscript{st} April, she sends out a written reminder or renewal request and that goes out by ordinary snail mail\textsuperscript{10} because people have to fill in those details and not all our members have email, but that is just an old fashioned snail mail system.

And how do you maintain the detail?

Well the detail is maintained on a data base in Excel\textsuperscript{11}.

What about online booking system?

We’re very lucky we don’t have to book our courts\textsuperscript{12}, people simply turn up and there’s an agreed set of allocation of the courts and so people turn up knowing that the courts allocated to say men on one evening and women on another evening…tennis on another evening, but unlike many tennis clubs we don’t have to book courts.

Do you have a booking systems where you have flood lights where there’s restricted access for instance?

Yes indeed, we have flood lights, we have, all our 6 courts are flood lit, but even so that doesn’t require booking, I’ve always been surprised but, occasionally people have to wait to get on court, but if people are waiting you play one set and you stop at 6 all or even have a tied break and go off at 7-6 but there is no online booking system as such.

\textsuperscript{10} IT systems
\textsuperscript{11} IT systems
\textsuperscript{12} IT systems
Do you have any tournament software?

We don’t at the moment\(^\text{13}\), we have been thinking about that. We do run tournaments but once again we just at this moment do it on a kind of, as a straight forward sheet goes up on the notice board, people sign up for the tournament and the names are drawn out of hat to allocate where they play or after the seeding and from then on in people just fill in the names of the winners on the sheet.

Do you have a website?

We have a website\(^\text{14}\), actually it’s a very good one and if you go to Google and put xxxxxxxx Lawn Tennis Club just Google and then that will bring you straight to our website, and I can’t tell you the exact, I think it’s xxxxxxxxtennis.co.uk but just so that you get it right if you want to look at our website. It’s a very good website, it’s not managed by myself, it’s managed by somebody who enjoys doing it.

Is that a volunteer?

Indeed.\(^\text{15}\)

Were you ever in Total Tennis?

Total Tennis?

Yes there was a facility by the LTA where you could sign up and get an LTA website which was effectively yours but hosted by the LTA

No the answer is no.\(^\text{16}\)

Marketing, what do you do in the way of marketing?

\(^{13}\) IT systems
\(^{14}\) IT systems
\(^{15}\) Organisations
\(^{16}\) Websites
Not a lot of marketing, what we do is we have advertisements now and again in local papers particularly in the summer. We have an open day once a year that we publicise in a leaflet and anybody can come along and see the club and hit balls with the coach, and we do put the occasional press release out when somebody in the club has done something notable.

**Do you have a newsletter?**

I think the newsletter one is important because it’s, and *being able to send out mass emails*\(^{17}\) when you know how to do it and providing you know how to do it using blind copies so that people don’t get emails with 365 addresses to top is absolutely the way forward and sending out snail mail newsletters which I think probably some clubs, or maybe many clubs do is one hell of a sweat…

**Yes.**

…tales, knowing how to print labels which not everybody does know how to do, mail merge print label thing, plus going off to the Post Office plus enveloping whatever 300 versions of a couple of sheets of A4 and so I think in the…email has made communication with members just so brilliantly easy that that is probably the most powerful took that a club like ours can use.

**That’s very interesting. On a different subject do you have any online sales or EPOS?**

*No we don’t*\(^{18}\)

**Ok yes, Thanks. Financial systems? How do you manage the finances of the club?**

*Our treasurer uses Excel.*\(^{19}\)

**Right ok and the last one on systems is coaching aids, do you use anything for coaching?**

---

\(^{17}\) IT systems

\(^{18}\) IT systems

\(^{19}\) IT systems
No I don’t know quite what that would be, our coaches, we have 3 coaches and they just hit balls on courts.

Oh well no there are some quite sophisticated systems where you can video, play back etc.

Ok, I don’t actually know, I know the sort of thing you mean but no our coaches don’t use those²⁰.

No ok. The next question is sort of a summary of, but how integrated are all these systems?

Answer is not at all.²¹

Lastly in this part, how effective would you say your systems are?

Not very would be the answer²². They are okay and they do what they need to do but we would like to do more with email and the like

Thanks very much. Are there any other systems or software that you use that might be useful for my research?

None that I can think of offhand.

That's fine. Ok, part of my research looking at systems is the interaction with other organisations. I have a list here which if I may I will read out and if you know and you do interface with them then I’d be interested in how, if not then it’s a simple ‘no’.

The first one is ‘The Department of Culture, Media and Sport’?

None at all²³.

---

²⁰ Coaches
²¹ IT systems
²² IT systems
Ok ‘UK Sports’?

No, I think the answer to that is no.²⁴

The next one is ‘Sport England’

No.

No, ok.

Don’t interface with them at all, what we do, *we integrate with ‘Herts. LTA*²⁵ which is the ‘regional LTA Association’, *we integrate with the other local leagues*²⁶…District Tennis for example we have all sorts of teams playing, so we integrate with the tennis world…but the other ones you mentioned no.

Ah that’s interesting as the regional LTA is on my list?

Oh okay.

In the same line, what sort of interactions do you have with the LTA?

None at all that I am aware of²⁷.

Okay, what about ‘The Council’?

We only liaise with ‘Xxxx District Council’ *when there’s something which relates say to the club or the premises.*²⁸
For the lease.

Yes but we have recently signed a new 30 year lease with, for our land, for the grounds and so during that time we had a lot of negotiation and I suppose you could say it went on for a couple of years with the Council, but that’s now been finalised and we’ve got the 30 year lease and I had liaison with the leader of the District Council because we wanted to display an advertisement on some public tennis courts “Come along and join us’ and I had to get planning permission…

You had to get planning permission?

You do, to actually put up an advertisement you have to get planning permission.

Ok, how big was the advertisement?

Let me see it was about 1 ½ feet by 2 ½ feet.

Oh ok so that’s quite sizeable, and has that benefitted you, has that been successful?

To tell you the truth I don’t know. I personally as secretary, I’ve rather been out of things for a bit, I’ve not been playing tennis for about 7 months for health reasons and I could find out from our membership secretary if people have been ringing him up saying can they join because they’ve seen the advertisement, so at the moment I can’t quantify that.

No ok, that’s ok it’s one of those marketing areas and I wondered if you had been able to quantify what benefit it has had for the club?

the nearest I can get to that is that when we had the open day which was back in June I think, we did, we had a stand, they have a village tournament, has a village day and on that day they have a long, they take part of the common and all the local societies put up stands and pennants and tables and things and kind of make the general public aware of them, and we did that too and I think we had about half a dozen, ten people who came along to the club and looked round and had maybe…and at the, at our table we must have had I think 40 or 50
enquiries, we had leaflets which we handed out but the extent to which those get converted immediately into membership is pretty small.

   **Ok moving on, what are your interactions with other private clubs?**

   As I mentioned *we play in the local leagues against other clubs*[^29] but that is about the extent of it.

   **What about local schools?**

   *We don’t do anything specifically about local schools*[^30] and some of our coaches, our 3 coaches all have junior squads and those junior squads come from local schools and no doubt the kids that play will have told their local school, but in terms of do we go and kind of market tennis to the local schools, the answer to that is no.

   **The last one on my list is what is your interaction with commercial clubs?**

   We don’t regard those as direct competitors because first of all they have indoor courts, secondly they are enormously expensive compared to us, our membership fee for an adult is £220 and I think the membership fee of a place like David Lloyd is probably closer to £100 a month or £70 or £80 a month, but anyway very, very much more than we…and the clubs have…facilities which we don’t like swimming pools, there’s steam rooms and so on and that sort of thing.

   *My understanding of commercial clubs is that you pay to play as well. Is that right?*

   And you pay to play as well, so we don’t look on them as competitors, a few of our members are members of another club as well, but I’d say that’s fairly exceptional.

   **Ok and the second to last question is, what would you like to happen to systems generally to support tennis over the next 5 years?**

[^29]: Organisation
[^30]: Organisation
Yes, we are a very independent minded club and we are financially sound, we’ve got 50 or so grand in the bank at any one time and so we don’t look for help outside particularly, we know that the Lawn Tennis Association is there with cheap loans if we wanted to say resurface our courts with something else, but on the whole when it’s come to big…expenditures like that we’ve just paid it out of own bank account. So in terms of wanting for help there’s not much appetite for that.

But our main trouble is that we are aware that our membership is around, starts around, mainly around age 35 through to 70 and we have a very, very strong juniors section, although we’ve talking now about 10 year olds through to about 18 year olds but then when they’ve gone to University they don’t necessarily come back here they get stuck into clubs somewhere else and so the gap, age gap that we would love to fill I suppose you’d say is in the range 20 to 35.

And lastly, do you think we have the right amount of competitive tennis played.

That’s very hard for me to say. We play tournaments in the club and interclub matches but overall I don’t really have a view.

That’s great. Thank you very much for your time, it has been really helpful. Is there anything you would like to ask me?

No. Thanks. Good luck with your course.

Thanks very much and thanks again for your time. Goodbye.

Good bye.

END OF INTERVIEW
INTERVIEW 4: DISTRICT COUNCIL

[Preambles excluded from transcript. It includes a personal introduction, confidentiality and permission to record the conversation]

Legend: Bold Red – Core question

Bold Blue– Probe or follow-up question

Italics: Coded statement

Footnote: Statement coding category.

If you could give me an outline of your role and organisation please?

My name is xxxx, I’m a Sports Team Leader involved in centres and sports development, and organisations at a local centre which is xxxx District Council.

And is this wholly owned by the Council?

These are Council sports facilities we’re talking about. The facilities are owned but we contract them out to a sub contractor to run them\(^{31}\).

Can you tell me who that is?

Yes it is Xxxx Leisure.

And do you know if they are a trust?

Yes in fact that are and they run a number of centres but they are separate from the council.

Okay. How many courts do you have at your centre?

We’re looking at 3 outdoor courts on one site\(^{32}\) and there’s the normal leisure centre and an 1 outdoor court on another site\(^{33}\) just sort of attached to the centre.

\(^{31}\) Non Clubs

Page 240
Would you like to know about outdoor public courts as well?

Yes please

In a park we’ve got 3 further out door courts.\textsuperscript{34}

And how is this managed?

People can just turn up and play\textsuperscript{35}.

Is there any booking arrangements?

There’s no pre-booking\textsuperscript{36}.

Do you know who plays on them?

…people from any age or whatever go and play on them.

Sorry no I mean do you know names as an example?

No we don’t know that level of detail\textsuperscript{37}

Can you tell me why you have done it that?

Yes I mean these courts are quite old. No floodlights but they’re not operational any more…and the condition isn’t too bad…one of those long standing things that private court people do play but the use isn’t that great just play on an open court really.
That’s very interesting. Okay I have a list of IT systems that I would like to ask you about if that’s okay?

When you talk about systems, are you talking about software systems?

Yes.

*We use a Torex system which is used by the local authorities for their booking, pay and play membership system*.  

Can you spell that please?

T.o.r.e.x, it’s called Torex but I think they’re named something else now, and we could have gone with other things like Microcash but it’s just the software we decided to go for.

What does that cover?

It does I mean *it’s the booking system, it’s the memberships system, it’s the taking the money system, it’s the form writing system* and all that sort of thing.

Do you have online booking?

Not yet, *we are looking at online booking*, we have been looking at online booking for a while, so no not at the moment.

Ok do you run tournaments and if so do you run tournament software?

*We don’t run tournaments*. The contractor doesn’t really run tournaments they did get, over the summer and sort of a wanted us to come in to sort of do some coaching…enter some sort of tournaments to all those people being coached…

Okay

---

38 IT systems  
39 IT systems
But no we don’t.

No ok.

We don’t as a local authority we don’t and our contractors don’t either.

Do you run a website?

We have the website run by the contractors\(^{40}\) and we also have a local council website.

So you don’t update the website yourself?

No that is done for us.

Ok, marketing. What do you do to market the facility?

We do do marketing to anybody or any sort of sport as well, it’s not tennis orientated. I mean like from our part but we’re just talking about sports a development strategy and the fact that is we could, how many sports do we want to choose to actually develop things, but that’s down to the resources…

Ok, financial systems?

That’s part of the Torex system.\(^{41}\) That takes the money and books the court and that money is held by the contractor as part of their contract income.

They are involved in some bits like you know the Torex booking system and …that sort of thing. They operate 5 parts but have nothing to do with the open air court.

Yes but, yes ok. One of the things I’m interested in is how integrated are the systems which in your case is the Torex system.

\(^{40}\) Website

\(^{41}\) IT system
Well yes it is integrated if that’s what is called. *They all work off the same system.*

It’s the software depends how good they are, they should do the online payment system but they’re working on the next upgrade for that but they’ve been working on that for the last 2 or 3 years…do, do online booking depending on what their software is.

**Just so I understand you don’t have online payment but they are in the next upgrade?**

*Yes but they’re looking at doing courses* and things but it’s easier said than done the whole online booking system.

Because of the small sums of booking, if you were going to pay £3.00 for a badminton court, tennis court or whatever the cost of actually administering that £3.00 and there’s potential ongoing costs which it’s not like paying £50 when you’ve got an admin fee or whatever.

**Okay, do you have any online sales.**

*No we don’t do any sales online.*

**Lastly in this part, how effective would you say your systems are?**

*Pretty good actually.* They are not new but we have got used to them and understand what it can and can’t do. We would like the upgrade and we will get that one day.

**Right. I understand. The next area on my list I’m interested in is interaction with other organisations, Firstly, ‘The Department of Culture, Media and Sport’?**

*Yes we get emails from them.* We link into the indicators that they set out and all that sort of thing, so the DCMS we know them, yes.

---

42 IT system
43 IT systems
44 IT systems
45 IT systems
46 Organisations
Ok. ‘UK Sport’?

Yes sort of worked with them on conferences\textsuperscript{47} or seminars training or whatever, so yes.

‘Sport England’?

They work, not as much as we did with, but yes through perhaps the …Sports Partnership’ who tend to be their sort of local arm, so yes, I mean obviously we get all their emails too about…Olympics and all of that.

The Central LTA and Regional LTA’s?

Yes perhaps through some local reps\textsuperscript{48} or whatever, sometimes we’ve a County level would work with them, it depends if they’ve appointed somebody and then that person knows…and they don’t reappoint, things go on, but yes.

what sort of things would you do with them specifically?

…looking at tennis development programmes\textsuperscript{49} of working with specific clubs who develop our sort of games idea with them, they perhaps choose 2 or 3 clubs and go for club members and that sort of thing.

Oh ok that’s interesting. Private Clubs is my next area? What interactions do you have with them?

We’ve got some, if they want to develop their facilities like the tennis courts…floodlights or whatever, so we do do that and that’s…schools as well, we sort of tell them about that because some of them want to work with schools more than others, so yes we, that’s not a problem working with the private clubs.

Ok, schools was my next on the list in fact as well.

\textsuperscript{47} Organisations
\textsuperscript{48} Organisations
\textsuperscript{49} Organisations
Yes loads of work with schools, worked on the Schools Sports Partnership\(^{50}\)…games…games thing, whether it’s organising activities, not always with tennis…

No.

…but I mean…games or with thinking about with clubs to do with schools we do that here.

Ok fantastic, Any interactions with Commercial clubs?

Commercial Clubs?

That would be the David Lloyds or Esporta’s as an example.

We don’t have any David Lloyds within Xxxx or Xxxx District.

Oh ok, that’s good. Ok nearly finished. What would you like to see happen to systems that support sport or tennis specifically over the next say 5 years?

…they, the integration of getting people together to do competitions and things, but systems may not be a problem it’s more facilities maybe a problem.\(^{51}\)

Actual courts and changing rooms do you mean?

Or the netting or the floodlighting or obviously getting members in and partly perhaps the members may be a problem. Such as coaches…to actually coach tennis because sometimes it’s really popular and not a problem but they need more facilities, but they’re still perhaps tainted with a bit of this snobby type of thing with tennis.

And lastly, do you think we have the right amount of competitive tennis played.

\(^{50}\) IT systems

\(^{51}\) Non Clubs
I can only really judge from our centre and we don’t really play any competitive tennis here really so I guess there should be more competitions and tournaments.

**Ok is there anything else you would like to add?**

I don’t think no, I suppose contacting someone about these indoor tennis centres maybe useful because obviously the one we’ve got in Xxxx is 4 tennis courts…

**Yes, absolutely. I have asked all my questions now. Thank you very much for your time, it’s been very interesting and very useful**

Ok, good luck with it all.

**Thank you very much.**

Thank you, bye.

**Cheers.**

**END OF INTERVIEW**
## Appendix D: Coding Extract

| IT Systems | 17 | [membership] Nothing IT related. Probably doesn't even use a spreadsheet. |
| IT Systems | 18 | [membership] set something up on an excel system in the bulk of cases. |
| IT Systems | 24 | We have a new online membership system aimed at multi sports. |
| IT Systems | 3 | We use online booking to be able to book over the internet. |
| IT Systems | 14 | We don't have bookings for courts. |
| Organisations | 1 | Organisation structure is really very complex |
| Organisations | 21 | Each secondary school has a hub of primary schools around them. |
| Website | 2 | A web page would be the answer to open invitational tournaments just asking people to enter. |
| Website | 15 | Free website and a good tool to communicate with their members. |
| Website | 18 | [lit free website] very difficult to follow. |
| Website | 18 | Very simple website - it's not a sophisticated one but its quick and easy to use. |
| Website | 19 | Lots of people say we found you on the website. |
| IT system | 41 | [club] Yes we use Excel to maintain the membership register |
| clubs | 53 | We have a large number of volunteers who input the data and it doesn't always work. |
| competition | 47 | For tournaments we use the tennis tournament planner (TTP) programme. |
| IT systems | 48 | [council]. We have no booking system. |
| IT systems | 49 | We don't specifically track demographics. |
| IT systems | 50 | No online booking. Just phone in. |
| IT systems | 52 | Clearer system for ratings and rankings. |
| IT systems | 53 | Membership package so that we know exactly who joined for what. |
| IT systems | 54 | First leisure operator to introduce online booking. |
| IT systems | 54 | Information is extracted for a separate
<table>
<thead>
<tr>
<th></th>
<th>page</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>IT systems</td>
<td>59</td>
<td>our systems are not integrated at all.</td>
</tr>
<tr>
<td>IT systems</td>
<td>60</td>
<td>financial system for the county is standalone</td>
</tr>
<tr>
<td>IT systems</td>
<td>63</td>
<td>we use Oracle for the financials provided by the council</td>
</tr>
<tr>
<td>non-clubs</td>
<td>48</td>
<td>[council] Our courts are free</td>
</tr>
<tr>
<td>non-clubs</td>
<td>57</td>
<td>If they turn up and pay cash then we don't know who they are.</td>
</tr>
<tr>
<td>non-clubs</td>
<td>57</td>
<td>we know who they are if they have leisure card.</td>
</tr>
<tr>
<td>non-clubs</td>
<td>63</td>
<td>We are a unitary authority which means we manage ourselves.</td>
</tr>
<tr>
<td>non-clubs</td>
<td>65</td>
<td>not for profit organisation. All profits are ploughed back into the organisation</td>
</tr>
<tr>
<td>organisations</td>
<td>53</td>
<td>DCMS No</td>
</tr>
<tr>
<td>organisations</td>
<td>53</td>
<td>UK Sport No</td>
</tr>
<tr>
<td>organisations</td>
<td>53</td>
<td>schools - a couple of schools which uses our courts.</td>
</tr>
<tr>
<td>organisations</td>
<td>57</td>
<td>Sport England - funding</td>
</tr>
<tr>
<td>organisations</td>
<td>58</td>
<td>Our stats report the number of uses of courts not the number of individuals however it is extrapolated as the number of people.</td>
</tr>
<tr>
<td>organisations</td>
<td>59</td>
<td>commercial - no. Not direct competitors as we are very much smaller with less facilities but we are cheaper.</td>
</tr>
<tr>
<td>website</td>
<td>50</td>
<td>obviously the website is a major marketing tool.</td>
</tr>
<tr>
<td>website</td>
<td>50</td>
<td>40000 hits over the duration of the tournament.</td>
</tr>
<tr>
<td>website</td>
<td>60</td>
<td>total tennis being phased out for clubs but not for counties</td>
</tr>
</tbody>
</table>
Bibliography


Huang, Z. and Palvia, P. (2001) ERP Implementation issues in advanced and developing


2, pp. 171-184.

London.


qualitative criteria in the measurement of performance in small firms., Journal of Small


Jones, I. (2000), Ethnographic research into the fans of Luton Town Football Club

192-222.


The Times (2006) LTA serves up new system to find winners, *The Times*, 7th June 2006


