STRATEGIC PLANNING FOR INFORMATION SYSTEMS:

A sociotechnical view of boundary and stakeholder insufficiencies.

A thesis submitted for the degree of Doctor of Philosophy

by

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ABSTRACT

The thesis proposes that Strategic Planning for Information Systems (SPIS) has become ineffective through a tendency to focus on the information technologies involved. The thesis argues that the dominant rational, reductionist epistemology of SPIS methods, tools and techniques limits the effectiveness of SPIS through methodological impoverishment. The thesis proposes that a humanistic, sociotechnical perspective of SPIS accommodates the use of complementary tools and techniques that improve the process.

This thesis advances a new Framework to improve the process of SPIS based on the propositions; first that the lack of sufficient knowledge of both the internal and external environment is a root cause of many of these insufficiencies, and second that this knowledge is held within the stakeholders of this process.

An emancipatory information systems research programme (Klein and Hirschheim, 1987) is used to advance a framework that overcomes the insufficiency and inadequacy of the process of strategic planning for information systems in organisations that permits information systems to fail. The framework is tested on two organisations and shows that the proposed Framework has significant potential to improve the SPIS process. The case research investigates the role of stakeholders, knowledge, and boundaries in the process of SPIS in order to develop more sufficient methods for the process of SPIS that address the perceived inadequacies in current processes, and thus provide an improved strategic planning process for information systems. Two novel tools are introduced: the Stakeholder Web and the Interaction Matrix. Their evolution is a major contribution of this research. The collection of tools presents a practical research contribution for the SPIS process and as generic (methodological) research tools.

A new definition for the term 'stakeholder' is formulated and used to supply clarity in understanding for this study – and would prove useful for the field of IS.

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Thank you also to my supervisor, Tony Elliman, who encouraged me and was patient through this long gestation. My thanks for your insight and questioning.

Finally, I must thank my friends and relatives, who must have thought this thesis would never be submitted, and who were often put to one side as the work gripped. Last and not at all least, my thanks to my children and husband Jim, without whom this never would have been completed as he encouraged me through the dark days and wouldn't allow me to give up.

PREFACE

The interest in stakeholding began for me when I was studying for my MSc at Brunel in the early 1990s. Having worked in industry prior to entering an academic career I had been involved both from a end-user, and from a system specifier, perspective on the implementation of new IS into organisations.

My studies in Brunel had flagged up a number of issues that resonated with my practical experience and related to the system I had decided to study (at my old employer) for my dissertation. In particular some points seemed to emerge that related to why systems failed. Accordingly when I was approached, with my husband, to write a series of articles for Marketing Business, our thoughts turned to better system specification. It seemed appropriate to base this around my dissertation case as Jim, (my husband), had been the UK project manager on this system. Two articles were subsequently written. The first, on which I was lead author (Coakes & Coakes 1994), concerned itself with critical success factors (CSFs) in system specification and the necessary involvement of stakeholders. In order to illustrate potential system stakeholders I devised a holistic diagram (a Stakeholder Web) of the potential stakeholders in an IS that could be used for reference purposes when seeking CSFs.

This Web was later used in my first paper written for this thesis to illustrate the complexities of the stakeholders in one of the study case organisations (Coakes & Elliman 1997) and subsequently used again in the papers Coakes & Elliman 1999 and 2001. During the course of the period from 1994 to 2002 this web has evolved and changed in format and, to some degree also, intention.

Declaration

Three papers (detailed below) have been published in the course of this research and present different aspects of the theoretical and practical findings that will be discussed in detail in the thesis. Elements of these papers are utilised in Chapters Three, Five and Six. As shown three papers were published with my Ph.D. supervisor and I would like to acknowledge his comments on the work submitted and my thinking during their execution.

Some elements of other work for which I am sole author on the topic of sociotechnical thinking and knowledge management have also been incorporated into the various chapters. No part of the material presented in this thesis has been submitted previously for the award of a degree at Brunel or any other institution.

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CHAPTER ONE

Introduction to Strategic Planning for Information Systems: a Sociotechnical View of Boundary and Stakeholder Insufficiencies.

1.0 Introduction

In the course of studying the process for the Strategic Planning of Information Systems (SPIS) in large organisations, it became apparent that there were issues in this planning process that led to insufficiencies and inadequacies in the plans proposed. Motivated by this realisation, the research described below, set out to understand some of the root causes for these insufficiencies and to develop a framework of methods, tools and techniques that would help to alleviate and overcome these insufficiencies and inadequacies.

The thesis proposes that Strategic Planning for Information Systems (SPIS) has become ineffective through a tendency to focus on the information technologies involved. The thesis argues that the dominant rational, reductionist epistemology of SPIS methods, tools and techniques limits the effectiveness of SPIS through methodological impoverishment. The thesis proposes that a humanistic, sociotechnical perspective of SPIS accommodates the use of complementary tools and techniques that improve the process.

An emancipatory information systems research programme (Klein and Hirschheim, 1987) is used to advance a framework that overcomes the insufficiency and inadequacy of the process of strategic planning for information systems in organisations that permits information systems to fail. The framework is tested on two organisations. The case research investigates the role of stakeholders, knowledge, and boundaries in the process of SPIS in order to develop more sufficient methods for the process of SPIS that address the perceived inadequacies in current processes, and thus provide an improved strategic planning process for information systems. Two novel tools are introduced: the Stakeholder Web and the Interaction Matrix. Their evolution is a major contribution of this research.

This thesis advances a new framework to improve the process of SPIS based on the propositions; first that the lack of sufficient knowledge of both the internal and external environment is a root cause of many of these insufficiencies, and second that this knowledge is held within the stakeholders of this process. Examining the process of SPIS from the sociotechnical perspective shows these propositions to be well grounded in the established literature. Practical exploratory research supported these propositions and shows that the proposed new framework has significant potential to improve the SPIS process. It should be noted that there is a strong element of an emancipatory and participatory viewpoint underpinning and justifying this sociotechnical approach.

This chapter will introduce the literature relating to the strategic planning of information systems and the sociotechnical view, before discussing the aims of the research and the research stance.

1.1 Strategic Planning for Information Systems – a Review

Strategic planning for information systems (IS), and approaches to the process in order to develop priorities for information systems development, have been widely discussed in the literature of the 1980s and 1990s.

The following definition of the process of IS planning will be used for this study:

> "The process of identifying a portfolio of computer-based applications to be implemented, which is both highly aligned with corporate strategy and has the ability to create an advantage over competitors." (Doherty, Marplesa and Suhaimib, 1999, p264).

It is this process of IS planning that is considered in the discussions below, both in relation to the literature and additionally in relation to the framework proposed.

As the definition would indicate, the process of SPIS is important to any organisation, (Brancheau and Wetherbe 1987; Niederman, Brancheau and Wetherbe 1991; Champy 1993; Galliers 1993). Niederman et al (1991) comment that this process of SPIS is carried out in the light of technological uncertainty and sometimes unanticipated organisational

change. Thus they say long-range planning is difficult. A study by Premumar and King (2001) found that a longer time horizon helped in performing more of the strategic aspects of IS planning. However, the longer time horizon tapered out after four years due, they felt, to changes in technology and user requirements, the implication being that long-term planning was subject to environmental uncertainty and turbulence as discussed in Chapter Three of this study. Lederer and Mendelow (1993) argue that on occasions the plan is outdated before it can be implemented which is attributable to the length of time taken for the process to complete and, additionally, to an insufficiency in knowledge (by the planners) relating to the internal and external environment. In their survey of implementation issues relating to information systems planning, Lederer and Sethi (1988) identify that low participation (by stakeholders) in the process and high levels of hierarchy in the planning process impeded the development of a sufficient plan. The later study by Lederer and Sethi in 1992 noted that the process of planning was multi-phase and that outputs (included here would be the knowledge gained) from one phase impacted the follow-on phase. Thus an insufficiency in one phase would increase the insufficiency in the next phase. Misinterpretations and misunderstandings compound to cause further problems.

Segars and Grover (1999) additionally argue that the form of planning process that an organisation undertakes impacts on the effectiveness and sufficiency of the plan produced and that planning structures with narrow participation foster an isolated approach to plan formation with a lack of co-ordinated knowledge-pooling. Segars and Grover identified the most sufficient form of planning as being that, of what they term, the Learning School of planning. This form of planning demonstrated activity that was adaptive to changing conditions and a broad sharing of knowledge through participation and a comprehensive process. Henderson (1990) would agree with this view of planning stating that the organisational learning that accompanies a sufficient planning experience should result in improved capabilities in alignment, understanding, inter-group co-operation, environmental anticipation and easier change adaptation.

The process of strategic planning for information systems, Segars and Grover (1999) say, can be seen from a number of different viewpoints. They concentrated on the school of thought that drove the planning process but other authors have considered

instead the viewpoint of the methodology utilised to approach the process. Flynn and Arce (1995) identified both technical and social approaches to methodologies. In their typology, technical approaches were bottom-up with a focus on searching for productivity improvements based on IT utilisation. Social approaches, in contrast, were typically top-down and emphasised the analysis of business processes to identify strategic opportunities but failed to deal with the technical aspects.

Segars and Grover (1999) argue that the use of recognised methodologies such as are advocated and promulgated by consultancies such as IBM (IBM Corporation 1975), or Andersen Consulting (1989), or by other methods proposed by such authors as Martin and Leben (1989) prove too narrow and rigid for successful and effective processes of SPIS to take place. This evidence is backed by the study of Lederer and Sethi in 1988 which identified large numbers of problems with such methodologies, both from a review of existing literature, and from their own reported field study. They concluded that whilst only just over half of their study respondents were satisfied with the methodology for IS planning they utilised, less than a third were satisfied when it came to carrying out the plan. This would indicate that although some respondents were happy with the process, they were less happy with the output of the process.

Whilst it is clear from the literature that some failures can be attributed to a lack of either top-down analysis or bottom-up focus, looking at the process through only one lens fails to deal with the complexity evident in the situation - as the insufficiencies in the plans discovered by Lederer and Sethi (ibid) would indicate. The four most frequently used methodologies (Business Systems Planning, Strategic Systems Planning, Information Engineering, and in-house developed methods) had common problems relating to issues when implementing the plan even though their focus of analysis varied. Lederer and Sethi believed that this was related to the common underlying characteristics of these methodologies (which included lack of top management commitment and the length of time it took to complete the process).

This complexity indicates that it is necessary to take a more encompassing view of the process that would include both the social and technical aspects – i.e. a sociotechnical perspective. For as Mina, Suhb and Kim (1999) say, if there is only business specialist

input then the plan is likely to be technically unworkable, and if there is only IS/IT involvement then the plan will be overly technical. Mina et al's work implies that there needs to be a balance from all parts, and from all levels, of the organisation in terms of involvement.

1.2 The Sociotechnical View of SPIS

A sociotechnical view of the process of strategic planning for information systems thus combines the two paradigms of the social and technical worlds. Socio is derived from the Latin *socius* and had the original meaning of associate or companion, and it now relates to the social world or society (Random House 1967). The ideas of society and companion relate strongly to the word stakeholder, as all stakeholders in an artefact such as a Computer Information System (CIS) or in the planning of the process for such a system, must be companions in the same society (organisation).

Technology on the other hand, is derived from the Greek *technologia* whose meaning was related to that of systematic treatment. Its dictionary definitions are various but of particular interest and relation to its combination with word 'socio' are those offered by the Random House Dictionary (1967):

> "The sum of the ways in which a social group provide themselves with the material objects of their civilisation."

And that offered by Webster (1986):

> "The science of the application of knowledge to practical purposes (in a particular field)."

The word sociotechnical is made up of these two root paradigms and is intended to imply a broad viewpoint of the way technology is implemented in the social environment.

It is argued that consideration of only one paradigm, whether the social or the technological, is insufficient to fully consider the technology and the social environment in which it is acted upon. One definition of the term sociotechnical that this study thus offers is:

> The study of the relationships and interrelationships between the social and technical parts of any systems.

The process of SPIS should therefore be a process of balancing these social and technical sub-systems within an organisation.

Over the years, sociotechnology has developed a number of principles or moral imperatives that enlighten its practice in the process of organisational change (see Cherns 1976, 1987). (Note that the implementation of an IS is, by implication, a process of undertaking organisational changes, as existing processes and relationships will be impacted by this implementation.) These sociotechnical principles focus largely on the achievement of a participatory democracy with the optimisation of people and technology being a prime aim (Eijnatten 1993). It has become apparent that many strategic plans have not taken these principles into account during their process of development.

It is inherent in the process of SPIS (when sufficiently performed) that the end result or aim is to introduce relevant, effective and efficient technology that in some manner improves the organisational ability to perform its tasks and interact in a relevant manner to its environment. What is not always apparent in the performance of this SPIS is the concept of optimisation of both people and technology. In many cases the optimisation of the technology has been at the expense of the people concerned, and has thus, in many cases, resulted in the failure of the initiative. Business Process Re-Engineering (BPR), Enterprise Resource Planning (ERP), Customer Relationship Management (CRM) systems and more recently Knowledge Management Systems (KMS), are all examples of organisational-wide system implementations that could result from a SPIS process. All such enterprise-wide initiatives tend to have a predominately technological bias which in the case of BPR has led to a significant failure rate (Mumford & Hendricks 1996; Peltu 1996; Clegg, Gray and Waterson 1999). ERP systems face significant challenges in their implementation including the task of re-engineering their organisation's processes and culture, and thus may fall prey to the same problems that faced pure BPR implementations (Laudon & Laudon 2002; Sandoe, Corbitt & Boykin 2001). The most recent organisational-wide systems to be implemented - KMS - have also had a mainly technological bias and their failures have also been attributed to a lack of people optimisation (KPMG 1999; KPMG 2000).

Additionally, there is little evidence available so far to indicate whether CRM initiatives are any more successful than other organisation-wide initiatives that integrate people, process and technology (Performix 2001). What is clear is that overall such initiatives are extremely complicated as they are systems that integrate legacy systems with new technology and are thus prone to the technical issues that all such initiatives fall prey to. In addition:

> "Legacy systems will always have both detractors and proponents, usually close to the system. When deciding whether to replace or amend such systems it is necessary to ensure that the wider stakeholder interests are fully represented in the decision making process, so that a balanced view can be taken." (Coakes and Elliman, 1999, p26).

We can see therefore that any SPIS that advocates such initiatives must take into account a wider stakeholder interest group than is accepted in existing SPIS methodologies and methods. Additionally, the sociotechnical viewpoint adopted here would emphasise the participation of such stakeholders in the SPIS process, plus the learning that would take place from the knowledge-sharing of such stakeholders in the process.

1.3 Weaknesses in Existing SPIS Approaches

Earl (1993) examines the SPIS experience in 27 companies and identifies five different approaches to the process of SPIS – Business-led, Method Driven, Administrative, Technological and Organisational. Each approach has different characteristics and weaknesses associated with it and therefore, according to Earl, different likelihoods of success. In this article Earl identifies the Organisational approach as being the mostly likely to be successful and the Administrative approach as being most likely to be unsuccessful. The Organisational approach according to Earl has as its emphasis learning, with a basis of partnership in teams, and an interactive nature where priorities emerge. In Earl's typology of approaches to strategic planning no other approach considers learning and team participation, and in contrast the Administrative approach has resources as its emphasis and a central committee as its main influencer and priority setter.

The 1993 article has been cited a number of times in the SPIS literature and Doherty, Marplesa and Suhaimib (1999) initiated a project to gain further insights into the process of SPIS. Their results align quite closely with that of Earl's 1993 study showing that the most successful approach (rational adaptation) was that which was most similar to that of the Organisational approach and that a capacity to learn, achieved through wide participation and frequent (even continuous) revision of the plan was a major characteristic of this rational adaptation approach. This finding is confirmed by the work of Segars, Grover and Teng (1998) who also found that the rational adaptation approach the most effective way of organising IS strategic planning.

1.4 Steering Committees and SPIS

Large organisations, such as those studied in this research are likely to set up formal mechanisms for the planning and selection of IS projects for implementation, and thus in Earl's classification are most likely to take an Administrative approach to the process.

McKeen and Guimaraes (1984) identified four typical mechanisms for the selection of IS projects in a large organisation. These four – that of selection by top management only; by the MIS Director with or without an MIS committee; by Steering committee; or by user department managers with or without further consultation - were not found to be uniquely adopted by organisations. Many organisations combined two or more selection mechanisms and in particular combining top management with user department input was the most frequent, with estimated project size being the determinant as to whether top management was involved or not.

A survey by Nolan (1982) indicated that the use of steering committees to select MIS projects was rising in importance (in the research reported in this study, the case organisations used forms of steering committees to undertake their strategic IS planning) and McKeen and Guimaraes (ibid) put forward a number of hypotheses relating to the output of such committees. These seven hypotheses are detailed below:

1. *The use of steering committees to select projects will tend to elevate the origin of projects within the organisation;*

Projects are likely therefore to originate from the higher echelons of the organisation.

2. *The use of steering committees to select projects will favour projects that are part of the corporate plan;*

Thus legitimating the strategy and linking to the corporate mission.

3. *The use of steering committees to select projects favours large projects;*

Large projects seem more important for the organisation as a whole.

4. *The use of steering committees to select projects favours horizontally integrated projects;*

This rewards projects that cross departments and are seen as moving the organisation towards its mission.

5. *The use of steering committees to select projects does not favour vertically integrated systems;*

Vertically integrated systems may impact many levels of management but may reside within one department. Lobbying needs support and favour-trading and therefore needs a base of support and more effort to get agreed.

6. *The use of steering committees to select projects will favour projects whose users reside at lower organisational levels;*

Horizontally integrated projects tend to reside at lower organisational levels e.g. order entry.

7. *The use of steering committees for project selection favours more formal proposals;*

Unquantifiable benefits are often seen as 'soft'. This reinforces the need for completeness and formality, critical evaluation of needs, objectives, benefits and costs. Steering committees tend therefore to end up focusing on financial benefits.

Overall they concluded that steering committees favour large projects in terms of man-hours to develop and numbers of users; projects with little vertical integration; lower level projects (clerical to supervisory); projects with formal proposals with written cost/benefit analysis; and projects which demonstrate tangible and intangible benefits. This research

was repeated by McKeen, Guimaraes and Wetherbe (1994), who found that steering committees again favoured the large (and possibly riskier) projects that required extensive organisational change. These projects were likely to have a formal cost-benefit analysis performed. This research seemed therefore to validate their earlier paper.

These seven hypotheses and conclusions are used in Chapter Five to illustrate the activities of the case study organisations - UofA and UofB – and the role of their steering committees.

A further paper on steering committees in IS planning was written by Doll and Torkzadeh in 1987. In this paper the authors draw four conclusions:

- An MIS steering committee is associated with the existence of an overall written plan for systems development in both large and small organisations;
- An MIS steering committee is related to increased sophistication of planning and budgeting practices in both large and small firms, and separate plans and budgets for maintenance and development;
- In a large firm the existence of an MIS steering committee is associated with mutual agreement on a set of criteria for deciding which projects to do first; and
- The existence of an MIS steering committee is associated with management making a long-term commitment to provide stable funding for systems development in large firms.

These conclusions are also utilised in Chapter Five for story verification (see Chapter Four for discussions relating to how the case study research is written as organisational stories).

Karimi, Bhattacherjee, Gupta and Somers (2000) additionally found that the presence and roles of IT steering committees are significantly related to the level and nature of IT management sophistication in organisations. It would seem therefore that steering committees are most likely to be found in large organisations such as the universities (UofA and UofB) studied here. It should be noted here that Lederer and Sethi (1988) identified that publicly-owned organisations (as universities can be classed) had more severe problems in relation to the planning process than privately owned organisations. They state that this may be caused by an increase in the levels of hierarchy

(bureaucratisation) and an increase in the external pressures on these organisations (of which they would therefore require increased knowledge).

Using the Nolan (1982) paper, Karimi et al (ibid) defined these steering committees and roles as being the link between IT strategy and business strategy and that they were intended to match corporate concerns with technology potential. Citing Earl (1989) they give the committees' activities as including the approval and ranking of projects; performance review; determining resource levels and recommending major initiatives. They comment that few organisations seemed to understand the role of such steering committees that they had and that there was some confusion between Earl's identified roles of steering groups, policy committees and IT boards. It should be noted however, that many of these roles are not exclusive and that some committees may undertake more than one role. We see this confusion of roles in the case studies described in Chapter Five.

Evidence from various studies discussed above relating to why the process of SPIS fails have indicated that the various planning and steering committees set up to manage the process, have significant issues relating to their understanding of the organisation, its environment (internal and external), and management commitment to the plans devised. The lack of involvement of top management, and/or users; difficulties with finding team members who fit a prescribed (by a methodology) criteria; inappropriate assumptions about the organisation; failure to understand the legal, competitive, and technological (internal and external) environment, are all cited in Lederer and Sethi (1988) as examples of failures (in these committees) that would indicate the lack of knowledge that could be supplied by sufficient stakeholder participation. These result, according to their literature survey, in significant failures in the committee outputs in terms of plans and needs addressed, that would indicate a lack of learning had taken place.

The study by Premkumar and King (2001) emphasised that the efforts of, and inputs from, top management, users and planners affected the effectiveness of the process – the greater the resources that these groups input (and the greater the range of groups involved), the more effective the process. This also indicates the sociotechnical perspective of SPIS and for a large variety of viewpoints to be included. This would

emphasise the importance of stakeholder inclusion (and thus knowledge inclusion and the enhancement of learning) and the enhancement of the field from which stakeholders are chosen as is promoted by the framework described in Chapter Six.

In Chapter Five this study bases its analysis of the weaknesses displayed by the case study organisations described, on the prior work by Earl (1993) described briefly above. As is shown in Chapter Six the two organisations under study (UofA and UofB) fall mostly into the Administrative approach (with elements of the others shown) and so the difficulties they experienced are not unexpected. This chapter further details these approaches and Earl's research and proposes a framework which would move an organisation towards, and would support, an Organisational approach (in Earl's terms) to the process of SPIS. This proposal goes further than other works in the level of participation recommended in that, for instance, King and Teo note the importance of user participation (1997) in the process, and Galliers (1991) emphasises the need for senior management commitment. The SPIS Framework proposed emphasises the need for commitment to the process by organisational stakeholders from all hierarchical levels (both internally and externally), represented as appropriately on the decision-making bodies. This intense participation by stakeholders would increase the learning capabilities of the Steering Committee. This framework advocates the use of two specific tools to identify the stakeholders who should be involved – the Stakeholder Web and the Interaction Matrix.

1.5 Research Aim

This study was prompted by the realisation that in so many organisations there were information systems that were planned and either failed to get 'off the plan' or were started but never implemented. Additionally, it was discovered that many systems that were implemented were considered failures as (for instance) they were implemented too late, did not match the current organisational need, or provided insufficient capabilities for their (presumed) purposes.

There is evidence that systems that have been started, but never implemented, have cost the 'planning' organisations large sum of money, from many thousands of pounds to

many millions (Morris & Travis 2001), especially in large administrative-type organisations. It therefore seemed appropriate to ask:

- What is the insufficiency or inadequacy of the process of strategic planning for information systems in these organisations that permits these types of failed or never implemented systems?

It was proposed that these insufficiencies in the planning process that led to these inadequate or failed systems were related to the lack of sufficient knowledge of the internal and external organisational environment. It was also proposed that this knowledge is held by the stakeholders of the SPIS process and that lack of their knowledge is thus caused by the lack of participation by these stakeholders in the planning process. These stakeholders may not participate due to the boundaries set by the process within which the plan is formulated. The aim of the research project was thus to investigate the role of stakeholders, knowledge, and boundaries in the process of SPIS through the means of case study research, and to discover and develop more sufficient methods for the process of SPIS that might address the perceived inadequacies in current processes, and thus provide an improved strategic planning process for information systems.

Five argumentation steps in relation to SPIS are proposed to provide a framework for the answers to the question posed above. These arguments are illustrated in the literature and theory review in Chapters Two and Three and are utilised to develop theory in Chapter Six. The argumentation steps are that:

1. Current information systems (SPIS is included here) planning processes take a limited (bounded) systems view. These bounded views result from pre-conceptions and/or prejudices held by planners with or without intent, in addition bounded views are exacerbated by the use of tools with pre-set agendas;

2. A bounded view can thus set inappropriate system boundaries;

3. A bounded view also misses important stakeholders of the strategy planning and system development process, this follows from an incorrectly set system boundary location. It is important to note here that stakeholders reside both within and without the organisation and its systems, and views that do not acknowledge this fact limit the participants of the process's understanding of the systems' wider context;

4. Tacit and explicit knowledge reside in the organisational system stakeholders and that this knowledge requires to be retrieved and thus that stakeholders missed means information and knowledge missing;

5. Thus inappropriate projects can be chosen as insufficient information and knowledge to make a fit decision is retrieved from within the boundaries chosen.

1.6 Research Stance

This research took the form of an emancipatory information systems research programme (Klein and Hirschheim 1987) where there is no preferred reference discipline. Historical analysis, anthropological and ethnomethodological approaches, philosophical analysis and empirical data analysis are all acceptable ways to move forward in order to broaden the understanding of the issues relating to information systems. This type of programme proposes that the researcher take an independent viewpoint and judgement and (hopefully) assist in removing unwanted constraints on others. It accommodates interpretivist and subjective research approaches. Such a research programme fits with case studies and grounded data analysis.

This study thus takes the form of a literature and theoretical review plus in-depth explanatory and exploratory case studies. It notes that such work must be subjective in its interpretation of the data and, as Feyerabend would declare, that any theory derived cannot be free of anomalies as observational judgements may embody assumptions that are unnoticed and untenable (Feyerabend 1975).

It is based on a humanistic (and sociotechnical) worldview and concerns itself with the inter-relationship of the people within organisations and the technology that they utilise.

1.7 Chapter Contents

This study is divided into six further chapters.

Chapters Two and Three look at the literature and theory to answer questions relating to:

1. What role do stakeholders play in SPIS and where are these stakeholders located within and without the organisation?
2. Who are the important stakeholders in SPIS and how do we discover them? And why are they important?
3. How is the internal situation affected by the external?
4. How accurate are the system boundaries of both organisation and computer information system as normally defined in the relevant literature?

These questions are explored through three major theoretical areas – the theories of stakeholding in organisations, the theories of knowledge management relevant to stakeholder knowledge collection, and the theory of complexity as applied to organisations.

The methods for undertaking this research and the justification for the emancipatory research programme utilised in this study are described in Chapter Four. This chapter argues that technical systems such as computer information systems and the process by which the organisation chooses which project(s) to undertake (SPIS), cannot be studied outside of their social context, and thus a mainly subjective approach to the research was undertaken as demonstrated in the method chosen for telling the stories utilised in Chapter Five.

In order to verify the answers to the questions posed two longitudinal case studies were undertaken and in Chapter Five the organisational stories of these exploratory (and explanatory) case studies are told. These stories explore the role of stakeholders, knowledge, systems and organisational boundaries for the process of SPIS that affect these two university organisations (UofA and UofB), in an environment that exhibits aspects of complexity.

Chapter Six reviews and analyses the data from these case studies for additional insight into the issues raised. A Framework is proposed that overcomes the insufficiency and

inadequacy of the process of strategic planning for information systems in organisations that permits information systems to fail. Two novel (having no precedent) tools for stakeholder analysis are described – the Stakeholder Web and the Interaction Matrix. The tools, it is shown, assist in developing boundaries for the process of SPIS that are more sufficient and a better fit to an uncertain environment.

The study concludes by drawing together the objectives with the findings and shows how the tools described can be used in situational analysis. Chapter Seven additionally provides a study critique and suggestions for further development and research.

CHAPTER TWO

Stakeholders of the Strategic Planning for Information Systems Process

2.0 Introduction

Strategic Planning for Information Systems (SPIS) is the process of planning in a strategic manner, the necessary information systems for an organisation, to ensure its future well-being. It is inherently a rational process that requires knowledge, as complete as may be feasible, regarding the organisation, its capabilities, its future plans and the external environment, in order to make decisions about what systems will be required to ensure this organisational well-being. This knowledge, if sufficient, should not only improve the SPIS process but also the potential for success of the systems implemented. It is therefore necessary to discover through whatever means possible this knowledge. This knowledge is held in both tacit and explicit form. Explicitly because it can be discovered through documents, web-sites, databases and other organisational depositories, and tacitly because it is held by the organisational stakeholders in a non-explicit form i.e. in their personal knowledge that is not codified. These stakeholders may be both internal and external to the organisation. In this chapter is discussed how we might define who a stakeholder of the SPIS process is, looking at the theoretical grounding of Stakeholder Theory over the past 40 years.

In this chapter the concept of classifying stakeholders as drivers or influencers is introduced and their impact on decision-making processes discussed. In order to ensure the best possible SPIS for any organisation considering its internal and external environment, the stakeholder set retrieved, in order to discover the required knowledge, must include these drivers and influencers, whether within or without the organisational boundary.

This chapter (and Appendix One) therefore introduces the origins of the word 'stakeholder' and explores its meanings in the literature of the management and IS fields (note the literature on SPIS has little or no discussion relating to stakeholding and so the

nearest applicable field of study was taken for research and analysis). This chapter also tries to identify the problems associated with the meanings allocated to words and the potential for miscommunication that this might offer. It shows that context is important to the understanding of meaning. The chapter defines the meaning of the word stakeholder for this study, and for the process of SPIS. This definition underlies the search for stakeholders and in Chapter Six is discussed the importance of stakeholder discovery and its implications for the process of SPIS.

2.1 The Origins of Stakeholding

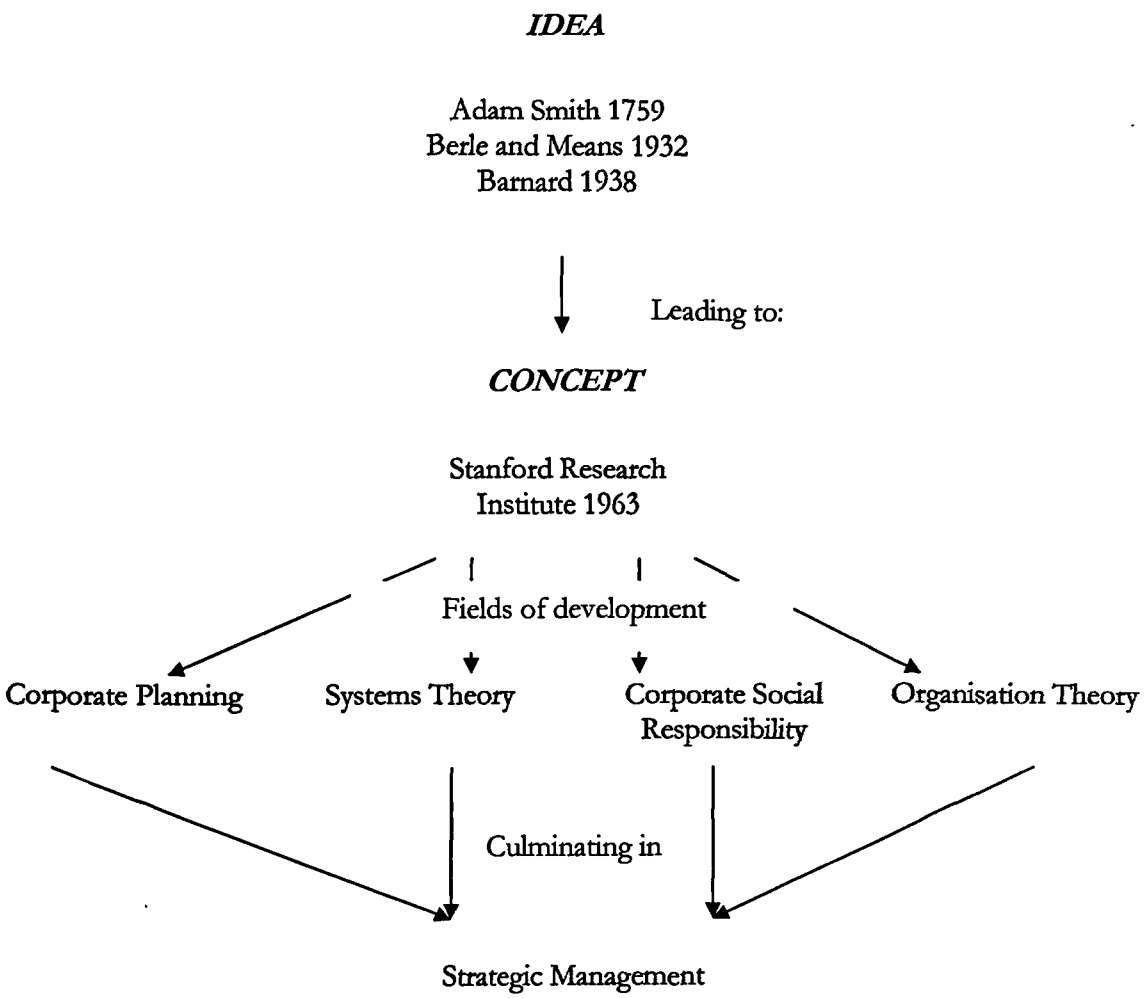
The word 'stakeholder' is used liberally in writings on organisational strategy and management. It is also mentioned frequently in writings on Computer Information System (CIS) development and discussions of CIS issues. Yet there is little or no consensus of what the word stakeholder means.

This chapter discusses the reasons for the interest in 'stakeholders' as defined by the context and provides, in Appendix One, a table of definitions from a number of authors. The key phrases and common elements are analysed in Section 2.6 below in order to derive a new definition of the term 'stakeholder' suitable for use in CIS/SPIS development discussions and that is utilised in the SPIS Framework described in Chapter Six.

To discover the history of the meanings now attributed to the word 'stakeholder' it is first necessary to explore texts in organisational and management studies.

Freeman (1984) in his definitive text on stakeholders within the area of strategic management, identifies the history of the idea as stemming from economic philosophy and offers the following chart of the concept's origin. He claims it stems from an idea that he dates back to Adam Smith and later writers of the early 1900s but that it was not formulated into a concept until the 1960s.

Figure 2.1 A History of the Stakeholder Concept (adapted from Freeman 1984 p32)



Freeman identifies the first use of the word 'stakeholder' in an internal memorandum of the Stanford Research Institute (SRI) in 1963. The term was intended here as a generality for those groups to whom management need be responsive and stemmed from the work of Igor Ansoff, Robert Stewart and Marion Doscher at the Institute during this period. SRI researchers argued that unless executives understood the needs and concerns of stakeholders they could not formulate policies that would receive the necessary support.

However, in actuality the term was in use in England much earlier than this – as early as 1708 according to the Oxford English Dictionary (1978), but with a very different meaning from that commonly used in the management literature. The author explores

the various meanings of the word and its usage across contexts in Section 2.6 of this chapter. However, before discussing meaning, the concept is explored and its development across the fields identified by Freeman is discussed. Stakeholder Theory has been a subject of much refinement in recent years and following the historical review, Section 2.4 reviews current thinking.

2.2 Stakeholder Concept Theory

From Figure 2.1 four initial fields of theory that explored the stakeholder concept can be identified:

1. Corporate Planning;
2. Systems Theory;
3. Corporate Social Responsibility;
4. Organisation Theory.

Each area examined stakeholders from a differing viewpoint and thus differing definitions and meanings have emerged which is discussed below.

2.2.1 Corporate Planning Concept

The Corporate Planning approach was initially argued by Ansoff (1965), (see also Cyert and March 1963), from where he derived a Stakeholder Theory of the firm. He maintained that the objectives of the firm should be derived from balancing the conflicting claims of the various stakeholders. Planning and policy are concerned with the configuration of an organisation's resources in relationship to its external environment. Stakeholders needed to be identified as groups whose support was essential for the continued survival of the organisation. Their behaviour was given as a restraint on corporate policy and strategy relating to the configuration of an organisation's resources for its external environment. Thus stakeholders were perceived as external threats and opportunities.

The stakeholder concept in Corporate Planning is used as a mechanism for gathering external evidence to predict environmental opportunities and threats. Stakeholders in this area of theory are clientele groups and according to Ansoff (1965) are 'managers, workers,

stockholders, suppliers and vendors'. In Corporate Planning the idea of stakeholders was of an abstract group of affectors of corporate policy and actions and in this notion stakeholders are not participants of the firm.

2.2.2 Systems Theory Concept

Ackoff (1974) and Churchman (1968) working in systems theory considered the work of Ansoff to be of importance. Ackoff argued that many societal problems could be solved by redesigning institutions with the support and interaction of the stakeholders in the system. In this approach stakeholders are considered an essential element in actively planning strategy and policy, and participation in planning is emphasised in contrast to the Corporate Planning approach above.

Corporate strategy thus becomes collective strategy. In the systems view there are two major variants relating to how organisations should interact with stakeholders:

'co-optation' - where stakeholders plan with the organisation for its future

and

'collaboration' - where stakeholders are involved in planning, in subsets, for subsidiary goals.

The systems view of stakeholders, whichever variant is applied, emphasises participation in decision-making and thus has a bearing on the SPIS development view and is implied in the sociotechnical perspective taken, as discussed in Chapter One and again in Chapter Six.

2.2.3 Corporate Social Responsibility Concept

A somewhat contrasting view to that of Systems Theory, was being developed at the same time in the field of Corporate Social Responsibility.

Corporate Social Responsibility literature and studies are relevant to the ethical issues of the business in the environment. Stakeholders may be thought of as those groups in the environment with an adversarial relationship with the organisation, rather than those with a supporting role. Dill (1975) wrote about the change from stakeholder influence

towards stakeholder participation in decision-making in particular regard to groups that might be considered adversarial (such as consumer groups, unions etc). This area of thought draws on political philosophy and ethical theory to identify the stakeholders in an organisation and to justify the proposed actions in their regard.

In this area of research a pragmatic social responsiveness model was developed which linked the analysis of social issues with traditional areas of strategy and organisation. Stakeholders in this model were analysed at a generic level. A stakeholder audit was part of a corporate social audit, which was used to analyse the actions of a firm in terms of social cost and benefits. This concept of social responsibility is taken further in Section 2.4 in the discussion of modern Stakeholder Theory.

2.2.4 Organisation Theory Concept

The fourth field of development towards Stakeholder Theory was that of Organisation Theory.

A major early contributor to the Organisation Theory literature regarding stakeholders was Rhenman (1964) who says that:

> "...it is a characteristic of stakeholders that they place demands on the company and the company has claims on them... each forms certain expectations, based on their conceptions of the company's goals and plans, of the likelihood of their claims being fulfilled." (p25).

Stakeholders are designated by those on whom the sociotechnical system of the organisation depends whether internal or external. This is a narrower idea than that of support and relates to the concept of those groups that "make a difference".

Rhenman's work was part of a programme of research into industrial democracy carried out at Stockholm School of Economics. The debate on industrial democracy was concerned with balancing the goals of increasing productivity with the various interests of stakeholders in the company. These interests (of customers, shareholders and employees) are almost certain to clash and resolutions can come about from the market forces, joint decision-making activities or co-opting of stakeholders. Because of their mutual

dependence on the organisation, stakeholders become mutually dependent also and need to be co-ordinated for effective employment of their contributions.

Stakeholder relationships are characterised by the simultaneous existence of both conflicting and common interests, yet their overriding goal is for the survival of the organisation.

2.3 Strategic Management and Stakeholders

These four fields of development led to the field of Strategic Management taking up the notion of stakeholders within and without the organisation.

Freeman himself wrote the major early texts on stakeholders in the Strategic Management field (Freeman 1983, 1984, Freeman, Banker and Lee 1981). He states that the stakeholder concept can be useful in integrating some of the issues around organisational strategy and how organisations can configure themselves with the external environment. His argument for the use of the stakeholder concept is that:

> "'Stakeholder' connotes 'legitimacy', and while managers may not think that certain groups are "legitimate" in the sense that their demands on the firm are inappropriate, they had better give "legitimacy" to these groups in terms of their ability to affect the direction of the firm." (Freeman 1984, p45).

Freeman places his work in a framework about managerial behaviour first, and organisational behaviour second. The implication is a shift towards an action orientation in a turbulent environment. The legitimacy of stakeholder claims on the organisation means that it is legitimate to expend resources on considering those claims and taking appropriate action to deal with those claims. For as Freeman (1984) says an effective strategist must deal with those groups that can affect the organisation, while to be responsive (and effective in the long run) they must also deal with those groups that the organisation can affect.

2.4 Modern Stakeholder Theory

Freeman's work has been developed and enhanced in modern Stakeholder Theory (post 1990), which can be divided into a number of strands. Three major strands of organisational theory – Business Ethics, Post-Modernism and Social Network Analysis – offer particular viewpoints on Stakeholder Theory. In addition, there is an on-going discussion in organisational and management literature (summarised in Mitchell, Agle and Wood 1997) relating to stakeholder identification and salience. This section and Section 2.5 discuss these ideas and the contribution being made to theory development.

2.4.1 Business Ethics

Business Ethics has a particular relationship to Stakeholder Theory for:

> "Stakeholder Theory, as a method of management based on morals and behaviour, must be grounded by a theory of ethics." (Freeman and Gilbert 1992, p133).

Indeed as Burton and Dunn (1996) point out, Stakeholder Theory is used to examine the good of individuals and to attempt to satisfy as many individuals or groups as possible.

Evan and Freeman (1988) say that:

> "... each stakeholder group has a right not to be treated as a means to some end (p97) (as they) ... benefit from or are harmed by, and ... rights are violated or respected by, corporate actions." (p100).

Therefore it follows that stakeholders have the right to participate in decisions that affect them and in determining the future direction of the firm in which they have a stake. This of course, matches closely with sociotechnical theory with its moral imperative towards participation. For Business Ethics Stakeholder Theory produces a number of challenges – firstly, the identification of the web of stakeholders in the organisation; secondly, the establishment of the rights of the stakeholders (both moral and legal); thirdly, the consideration of stakeholders interests; and fourthly, the art of balancing the stakeholder interests without specific tools (Smith and Hasnas 1999). It is these challenges that many of the modern theorists have attempted to resolve as described below. This study, in

contrast to most modern writers concentrates on resolving the first challenge rather than the other three.

Carroll and Näsi (1997) give us five key questions to ask concerning how we (as organisations) manage our stakeholders. These questions include asking and determining what responsibility - whether economic, legal, ethical or philanthropic - the organisation has towards its stakeholders. Having determined this responsibility it is then possible to take on board the Clarkson (1999) seven principles for stakeholder management from the ethical perspective. Of relevance to the discussion of participation in particular, are principles one and three.

> Principle 1:
>
> "...managers should acknowledge and actively monitor the concerns of all legitimate stakeholders and should take their interests appropriately into account in decision-making and operations." (p4).
>
> Principle 3:
>
> "...managers should adopt processes and modes of behaviour that are sensitive to the concerns and capabilities of each stakeholder constituency." (p4).

These principles however, do not propound stakeholder participation but rather stakeholder acknowledgment and consultation. Clarkson (1994) defines his essential core of stakeholders through their claims on the organisation. Claims can be through power, urgency and legitimacy but the essential claim is only through power and legitimacy. This view aligns with that of Wood (1994) who distinguishes between what he terms the 'bicycle wheel model' of stakeholder management where stakeholders are things to be managed and the interactive model which sees stakeholders as members of relationships mutually driven and not completely controlled by one party or another.

The ethical view taken by the above authors is in contrast to other modern authors who take a more instrumental and pragmatic view on the relationships between organisations and their stakeholders.

Authors such as Jones (1995) explain that trust and co-operative relationships with stakeholders help solve/alleviate some of the problems related to opportunism and that

an instrumental view of stakeholder management would imply a competitive advantage - purely in economic terms - could be achieved through these relationships. In addition, Merrick Dodd (1998) states baldly that those who manage businesses should concern themselves with the interests of stakeholders but makes no attempt to give reasons, or to justify whether this is an ethical stance or purely instrumental. This author's view is taken from a pure legality stance.

However, recent ethical thinking has drawn on a new (feminist) philosophy of interpersonal relationships to give shape to a theory of business ethics that is essentially relational.

Traditional philosophy (the masculine approach) is founded on an ontology of the self where 'Others' are seen as threats and rights are of prime importance – 'do unto others as you would be done by' is the defining phrase. Knowledge is seen here as abstract, universal, impartial, and rational. Persons are thus substitutable for one another with no impact on the outcome of the action under consideration. In contrast, feminist philosophy sees the person as relational. The self has relationships that cannot be separated from its existence. There is no 'I' unless there is a 'You'. It emphasises the responsibilities of the relationship rather than the rights, and is discussed through the idea of caring. Feminine philosophers say that humans only know through relationships. The third moral level (Gilligan 1992) gives all parties in a relationship responsibilities - they should consider both their own good (responsibility to oneself) and the other's good (responsibility to others) when deciding right action.

This clearly links closely with general organisational theory, which stresses the organisation's responsibilities to, rather than the rights of, stakeholders. For:

> "Stakeholder Theory ... considering Freeman's plea for voluntarism in dealing with stakeholders - seems to promote a more co-operative, caring type of relationship. Firms should seek to make decisions that satisfy stakeholders, leading to situations where all parties involved in a relationship gain. The inherent relatedness of the firm under Stakeholder Theory forces firms to examine the effect of their decisions on others." (Burton and Dunn 1996, p140).

Wicks, Gilbert and Freeman (1994) see the feminist interpretation of Stakeholder Theory as an example of the affirmative post-modern 'community conversation'. (See the discussion of postmodernism below). Wicks et al in particular, identify five masculine metaphors that have in the past been associated with the stakeholder concept. These metaphors are (that):

- The notion that corporations should be thought of as 'autonomous' entities bounded off from the external environment;
- Corporations can and should enact or control their external environment;
- The language of competition and conflict best describes the character of managing a firm;
- The mode of thinking we employ in generating strategy should be objective;
- Corporations should structure power and authority within strict hierarchies (p478).

They therefore offer a new stakeholder reinterpretation of the firm:

> "The corporation is constituted by the network of relationships which it is involved in with the employees, customers, suppliers, communities, businesses and other groups who interact with and give meaning and a definition to the corporation."(Wicks, Gilbert and Freeman 1994, p483).

and go on later to say:

> "...stakeholder management, understood in feminist terms, is about creating value for an entire network of stakeholders by working to develop effective forms of co-operation, decentralising power and authority, and building consensus among stakeholders through communication to generate strategic direction." (p493).

These metaphors, Wicks, Gilbert and Freeman (ibid) believe, serve to silence the voices of non-owner stakeholders. They therefore suggest five alternative metaphors that are drawn from the feminist ethic of 'care' and 'connected knowing' theory (Belenky, Clinchy, Goldberger and Tarule 1986; Gilligan 1982, Gilligan and Attanucci 1988). Gilligan (1982) sees the Female world as a world of relationships and psychological truths where an awareness of the connections between people gives rise to a recognition of responsibility for one another and a perception of the need for response. The connections leading to an Ethic of Care, according to Gilligan.

These feminist, ethical metaphors are:

> **Metaphor One**: Corporations as autonomous entities are recast as webs of relationships among the stakeholders.
>
> **Metaphor Two**: Companies enacting and controlling their environment are transformed into companies that "thrive on chaos" by adapting to the pressures of discontinuous change.
>
> **Metaphor Three**: Metaphors of conflict and competition are replaced with those of communication and collective action.
>
> **Metaphor Four**: Strategy as "objective" analysis becomes strategy as solidarity in relations between agents and stakeholders.
>
> **Metaphor Five**: Power and authority embedded in hierarchies is supplanted by radical decentralisation and empowerment (p165-7).

These points relating to the decentralisation of power and authority and the development of effective co-operation echo and resonate with the key tenets of the Knowledge Management literature relating to the management of tacit knowledge as discussed in Chapter Three.

2.4.2 Post-Modernism and Organisational Theory

Post-modernist thought (as mentioned above) in relation to management and organisational theory, is of increasing influence in the development of these fields, and has particular relevance to the fields of Business Ethics and Social Network Theory. Boje, Gephart and Thatchenkerry (1996) put this in context in their definition of organisations where they say:

> "...rather than conceiving of organisations substantively as concrete facilities embedded in artefacts such as policies and buildings, we regard organisations relationally as a concept of social actors that is produced in contextually embedded social discourse and used to interpret the social world. The meaning of organisation thus resides in the contexts and occasions where it is created and used by members rather than in a special fixed substantive form." (p2).

It is perhaps important at this stage to define what is meant by post-modernism and how the term will be used in this section. Here the definition offered by Gephart (1996) is used. Gephart discusses two meanings of post-modernism. The first being a cultural form or social era that follows modernism; the second is an epistemology of cultural production that reconceptualises the experience and explanation of the world we live in. It is the first meaning that has particular relevance to organisational theory, for in this view, post-modernism is a new and distinct form of society with a cultural logic that breaks with the past. This can be seen in the discussion above on feminist philosophy and business ethics.

Carlton and Kurland (1996) place post-modern Stakeholder Theory into the context of past discussions. They concern themselves with a theory of stakeholder 'enabling' in contrast to previous concepts which emphasis stakeholder 'managing'. Stakeholder enabling, they believe, "engenders stakeholder-firm interdependence" (p154). Stakeholder enabling also has an epistemology, an ontology and a praxis. The epistemology is that of 'interdependent connected knowing' (see the discussion on ethics above); the ontology consists of that of 'interactive organisational forms'; and the praxis is that of 'organisational discourse'. Enabling they emphasise, implies that the organisation's stakeholders, together with organisational agents, jointly exercise control over shared concerns, the praxis of organisational discourse also refers to co-operative ways of 'doing'. (See Chapter Six for how the SPIS Framework proposed incorporates stakeholders into the organisational discourse.)

Carlton and Kurland (ibid) see some origins of their theory in the writings of Evans and Freeman (1988), Freeman and Evan (1990) and Donaldson and Dunfee (1994). In Evans and Freeman's version of Kantian Capitalism (1988), Carlton and Kurland (1996) see that they redefine the firm's purpose by the invocation of Kant's categorical imperative - 'that all people should be treated as ends rather than as means' (p160). They contrast this with the 1990 work of Freeman and Evan where a Stakeholder Theory of 'fair contracting' seems to anticipate their theory of stakeholder enabling. It seems that in this later work, Freeman and Evan emphasise the interdependency of stakeholders and firms and the idea of 'reciprocal stakes'.

To Carlton and Kurland, the 1994 article of Donaldson and Dunfee offers Integrative Social Contracts Theory as a replacement for Stakeholder Theory. However they see it as more of an extension to the 1990 paper of Freeman and Evan, with a more robust epistemology of ethical rule building. Their criticism of the Donaldson and Dunfee paper lies in the inherent assumption of the notion of a hierarchy for decision-making and a:

> "...patriarchal praxis of managerial adjudication in agent-stakeholder relationships ... (which) assumes an external moral authority and fails to detect a process whereby values emerge, consensus (is) offered and consensus is achieved." (Carlton and Kurland 1996, p163).

Carlton and Kurland would thus find themselves in sympathy with the feminist morality viewpoints.

2.4.3 Social Network Analysis

Social network analysis looks, through what might also be considered as a feminine view (a web of relationships where an awareness of the connection between people gives rise to a recognition of responsibility for one another, and a perception of response (Gilligan 1982)) at the inhabitants of an organisation - the stakeholders - and their relationships with each other. Stakeholder relationships do not occur in a vacuum of dyadic ties, but rather in a network of influences (Rowley 1997).

Density is a characteristic of the network - it measures the relative number of ties in the network that link actors together and is calculated as a ratio of the number of relationships that do exist against the possible number if all stakeholders were tied into every other stakeholder. A complete network is one in which all possible ties exist and communication across the network becomes more efficient. In sparsely connected networks sections become isolated or segregated - cliques emerge and communication is restricted. The denser the network across the organisation, the more behavioural patterns and expectations are shared. Dense networks also allow stakeholders to monitor the actions of the focal organisation more closely. Less dense networks are more likely to exhibit conflicting stakeholder influences.

Betweenness measures the frequency with which an actor falls on the paths between other actors - the more central an actor is, the more other actors have to go through them to inform other actors and therefore the more access control they have over the network. They are the information gatekeepers. In Boddy and Buchanan's (1986) terms the central actors are the answer to the questions 'Who are the key promoters of the investment in new technology?' and 'Will the objectives of the promoters subvert or contribute to the achievement of the strategic potential of the new technology?' (p59). This would follow the ideas propounded also by Willcocks and Mason (1987) where they discuss the different perceptions of the same event that will be held by stakeholders and in identifying the different interests, background and values of the stakeholders, they comment the stakeholders will not therefore follow the same objectives. The power a stakeholder can mobilise, and the allies they can make, influences their relationship with the organisation and the project.

Network analysis resonates with the work of Freeman 1984 where he discusses power relationships between stakeholders and is also drawn on by some more modern CIS writers such as Carver, Lewis and Viakuntum (2001) who use influence diagrams to demonstrate political complexity and potentialities for disputation in CIS projects. In order to perform network analysis you first need to define the boundary under study - the issue of boundary definition is discussed in Chapter Three as it is clearly of great importance to define correctly the necessary boundary for the network of stakeholders of a Strategy or Project. Chapter Three argues against the rigid definition of boundaries as is required by such techniques as network analysis.

2.5 Stakeholder Identification and Salience

In their 1995 article Donaldson and Preston provide four theses relating to the themes of modern Stakeholder Theory and the writings of modern theorists. These themes are then used to identify the stakeholders of the organisation under discussion and the relationship that the organisation should have with these stakeholders. These theses are that:

1. Stakeholder Theory is descriptive - it presents a model describing what the corporation is;

2. Stakeholder Theory is instrumental - it establishes a framework for examining the connections if any, between the practice of stakeholder management and the achievement of various corporate goals;

3. Stakeholder Theory is normative - it involves acceptance that:
   Stakeholders are persons/groups with legitimate interests in procedural and/or substantive aspects of corporate activity;
   The interests of all stakeholders are of intrinsic value, each merits consideration for its own sake;

4. Stakeholder Theory is managerial - it does not merely describe situations or predict cause-effect relationships - it recommends attitudes, structures and practices that constitute stakeholder management.

These theses can be seen in the discussion in Section 2.4 above.

In addition, Mitchell, Agle and Wood in 1997, set out to build on the work of Clarkson (1994) in relation to power, legitimacy and urgency, and to attempt a definition of a theory for stakeholder definition and salience which would add to the four theses described above. Salience in this article is used to mean 'the degree to which managers give priority to competing stakeholder claims' and the authors comment that when looking at to whom and to what managers actually pay attention:

> "....among the various ways of identifying stakeholders, as well as in the agency, behavioural, ecological, institutional, resource dependence, and transaction cost theories of the firm, we have found no single attribute within a given theory that can guide us reliably on these issues." (Mitchell, Agle and Wood 1997, p854).

Mitchell et al (ibid) go on to discuss a number of points in relation to Stakeholder Theory. In particular they propound a rational for stakeholder identification which looks at five dimensions of the relationship between the stakeholder and the firm in order to make a judgment as to whether the group or person(s) being considered is a stakeholder or not. These relational dimensions being that a relationship exists between the firm and the stakeholder; there is a power dependence with the stakeholder being dominant to the firm; alternatively, there is a power dominance where the stakeholder is dependent on the firm; or there is a mutual power-dependence relationship, which is the basis for the

legitimacy of the relationship, which would lead into the idea of a stakeholder moral claim on the firm; and finally, a possibility where there is an interest in the firm but legitimacy is not implied.

In their stakeholder typology there are eight types including a 'non stakeholder'.

These eight are:

1. Dormant stakeholders who possess the power to impose their will but by not having a legitimate relationship or an urgent claim their power remains unused.
2. Discretionary stakeholders who possess legitimacy, but have no power and no urgent claims.
3. Demanding stakeholders who have urgency in relation to their claims but no power or legitimacy – like 'mosquitoes'.
4. Dominant stakeholders who are both powerful and legitimate.
5. Dangerous stakeholders who have urgency and power but not legitimacy – they may be coercive or violent.
6. Dependent stakeholders who have urgent legitimate claims but they depend on others for the power to carry out their will.
7. Definitive stakeholders hold all three necessary attributes of power, legitimacy and urgency.
8. The non stakeholder.

The six stakeholders who are missing attributes are classed as 'expectant' stakeholders and can become definitive stakeholders by acquiring the missing attribute(s). This stakeholder salience is discussed further below and in Chapter Six in relation to the data analysis from the two case studies.

The identification of stakeholders by power relationships is a common theme amongst modern Stakeholder Theory. Carver, Lewis and Viakuntum (2001) use guidelines to manage politics and both map stakeholders in a network-power influence and produce a matrix of such power-influence relationships to provide an indication of where conflict may occur. In a similar fashion Ramirez 1999 proposes that whilst stakeholders may be identifiable it is only those who, being empowered with knowledge and capacity, can

participate as social actors. Social actors being those who can make decisions and act on them. In addition he proposes that the attributes of stakeholders are a function of the social network they belong to.

In the Guidance Note provided online by the Overseas Development Administration (1995) stakeholder analysis is described as the identification of a project's key stakeholders, an assessment of their interests and the ways in which they affect project risk and viability. In particular to draw out conflicts of interest and relationships between stakeholders that can be utilised. This theme of identification of influence in order to reduce obstacles is to be found also in work by Dick (1997); Grimble and Chan (1995); Grimble and Wellard (1996); and the Management Sciences for Health's Quality Guide (1998); and is identified as key to the Cap Gemini method for organisational analysis where the opportunities and threats presented by stakeholders are modelled (2001).

The matrices typically devised by the above methods of stakeholder analysis are created subjectively, with pre-conceptions and are rarely looking for inclusivity but rather to minimise objections. In contrast Chapter Four describes stakeholder analysis through the tool (the Stakeholder Web) presented as a value-free and inclusive method of identifying interests in the system or plan under consideration. It specifically does not analyse or model influence and does not select stakeholders for inclusion by the power that they wield (potentially or otherwise).

2.5.1 Drivers and Influencers

However, as discussed above, the notion of salience, or *how to address the competing* claims of stakeholders, is valid when looking at the SPIS process. The tools offered here for stakeholder identification and the framework offered for the SPIS process, do not explicitly give weightings to the various stakeholders' claims, yet clearly some stakeholders will hold more power and influence than others. It is important that those stakeholders with most power are not the only stakeholders considered. Those with lesser influence should not be ignored, for as is discussed in Chapter Three, knowledge is held across many stakeholders and not only in the most obvious places. The greater the knowledge retrieved, the more sufficient the process of SPIS will become in a complex environment.

Thus is offered the concept of classifying stakeholders, irrespective of apparent power, as drivers or influencers. Driver stakeholders may apparently be easily discovered, as they are typically vocal and close to the process being undertaken. They are direct influencers of the decision-making process but not all may lie within the organisational boundaries. Some, such as governmental bodies, may be distant, yet their demands for reports and statistics from the IS under consideration are both legal requirements and valid and thus are drivers of the SPIS process. More difficult to discover are the (indirect) influencers as they are frequently more distant from the process, less vocal and may also be external. However, their requirements from the SPIS process may be as valid as those of the stakeholder drivers but may not be legally required. Importantly for the process of SPIS, the knowledge of who are drivers and influencers and what they require must be discovered and it is the tools proposed and the framework offered in Chapter Six that will perform this task with a greater degree of sufficiency than current processes.

Having surveyed the literature for themes and attitudes towards stakeholders (and organisational responses) and stakeholder analysis this chapter now looks at how the word stakeholder can be defined for the process of SPIS.

2.6 Stakeholder Definitions

In the table shown in Appendix One a chronological history of the development of the definition of the word 'stakeholder' in modern texts is offered. It is not intended as a comprehensive listing of definitions but as a sampling across the fields of research in two major areas - management and CIS development.

It is noteworthy, that whilst 'themes' of definitions emerge, conflicting or contrasting definitions may offered in different papers by the same authors. It would seem therefore, that authors' views of what might be defined as a stakeholder will vary over time and context. This point is emphasised below, but first the concepts underlying meaning are examined. The understanding that meaning is varied, contextual and not consistent is relevant to the understanding of how to retrieve (and make sense of) stakeholder knowledge and this issue is addressed in the discussion of how organisational knowledge can be retrieved in the SPIS Framework proposed in Chapter Six.

2.6.1 Communication of Meaning

Language is a set of arbitrary symbols using a rule system which provides a source of group identity. It is the primary means for communicating thought. There are universal elements contained within all natural languages – these being phonology (basic sounds), syntax (grammar), semantics (meaning) and pragmatics (how language differs according to context). The main feature and purpose of language is that of communication and thus communication serves both a social and cognitive purpose.

True communication requires that both the sender and receiver of a message understand not only the language (or code) of the message, but also the social and other relevant contexts n which the communication takes place. (For example the word 'chip' has several different meanings from an item of food, to a computer component, or a small sliver of wood, and context and cultural orientation will help define the meaning). The meaning, and also often the pronunciation are dependent on context. It is not enough to understand phonemes, morphemes and phrases, it is also necessary to understand the speaker's intention in uttering a particular phrase or sentence (Atkinson et al 1993). It is the issue of semantics and the correctness as well as appropriateness (the pragmatics), of meaning that will be addressed further below.

2.6.2 Words and Meanings - Semantics

> "'When I use a word', Humpty Dumpty said in a rather scornful tone, 'it means just what I choose it to mean - neither more nor less'."(Lewis Carroll).

Crossman (1959) argues that vague meanings, individually developed, lead to futile arguments as we assume that all proponents in the argument are using the same meaning. Unfortunately, most of us are operating like Humpty Dumpty and mean what we mean by a word and are often unaware that our proponent means something different.

The difficulty with describing language and attributing meanings to words is that one is forced into using language to make the descriptive statement, which is in itself open to misinterpretation and miscommunication. John Lyons (1993) says that the meaning of words is learned and maintained by the use to which language is put in communicative situations. He further says that the meaning of a word will differ according to context of

use and (grammatical) type of words as some words can be either (for instance) a noun or a verb (e.g. the word 'bow' which in English may be distinguished in speech by pronunciation and usage in context).

Language thus relies on common ground (Clarke 1996) – a joint understanding of the foundations around which the language and conversation is based, and an understanding of the situation, the meanings of words, the social and cultural background and the knowledge of the participants.

2.6.3 Meaning in Context - Pragmatics

The issue of context is extremely relevant when discussing the meaning of the word 'stakeholder'. It can be clearly shown to vary in meaning according to context (see Appendix One). It is this point that illustrates the necessity for a clear meaning of the word 'stakeholder' in the CIS/SPIS development context.

The Oxford English Dictionary (1978) identifies the first use of the word in a letter written in 1708 in the British Apollo no.55 2/1 as being:

> "a person entrusted with the stakes of bettors."

It is further mentioned in its meaning as 'one who holds the stake of a wager' in 1815 in the Sporting Magazine XLV (p231). In the meaning of 'depository' holder it is mentioned in 1858 in the Ld St Leonards Handy-bk. Property Law IV (p20). Webster (1986) gives as the definition of the 'depository' meaning:

> "A person entrusted with the custody of property or money that is the subject of contention between rival claimants in which the holder claims no right or property interest.."

Even recent dictionaries however, do not agree with a single meaning for the word, some (Chambers 1993) do not recognise the word at all, others such as the Cambridge International Dictionary of English (2002) define the word as meaning either:

> "A person or group of people who have a share or a personal or financial involvement in a business."

Or:

> "A person who is charge of the prize money or people risking money on the result of a game or competition and who gives it to the winner."

An alternative meaning is given by Wordsmyth (2002) is that of:

> "A person or group that has a direct interest in a negotiation or other decision-making process."

And legal dictionaries give yet another definition (or variations on this definition) as being:

> "A third person, chosen by two or more persons, to keep in deposit property, the right or possession of which is contested between them and to be delivered to the one who shall establish his right to it."(Lectric Law Library 2002).

Thus there are some similarities between the offered definitions but few relationships to the meaning usually utilised in management texts (the Wordsmyth definition being closest). This indicates the importance of context for the word definition.

2.6.4 A Meaning for CIS/SPIS

The identification of a (useful) universal meaning for the context of SPIS is complicated by the fact that 'stakeholder' is a composite, a word composed of two elements - 'stake' and 'holder'. Each element has in itself two lexemes (an abstract essential unit of vocabulary), which can be looked up in a dictionary.

When utilising the word 'stakeholder' most authors do not refer to a dictionary for meaning verification but rather refer to previous texts in their field that utilise the word and take the meaning that suits their purpose, not always understanding that there can be traced several different meanings for the word, and that a commonality of meaning is not available. From the appendix described, several themes emerge across the literature regardless of the discipline in which the writings were based. Below are identified five such themes showing where they originate from and are utilised.

Theme 1

realisation of personal goals

Although the first mention of the word 'stakeholder' in its modern management definition, is to be found in the memorandum of the Stanford Research Institute, the first published definition is to be found in the work of Rhenman in 1964. Rhenman talks of 'realisation of personal goals' and company dependence on stakeholders for the realisation of its goals. This idea is taken up again by Mitroff & Mason in 1980 and Vedder and Turban in 1990.

Theme 2

claimants with a vested interest

Writing in 1981 Mason & Mitroff add a further or alternate definition of 'stakeholder' as claimants with a vested interest. This theme is taken up by a number of writers – including Carroll in 1989; Lyytinen in 1987 and 1988; and Vincent in 1990.

Theme 3

affect or be affected by the achievement of the organisation's objectives

The definition offered by Freeman in 1984 has proved the most popular over the various disciplines. He stated that stakeholders were those who could affect or be affected by the achievement of the organisation's objectives, this statement being based on the work of Mitroff and Emshoff in 1979. This definition of the word is also taken up by Goodpaster 1993; Subramanian 1992; Thompson 1993; Ullman 1985; and Wood 1991.

Theme 4

people sharing a pool of values

Lyytinen working with Hirschheim in 1987 offered an additional definition as 'people sharing a pool of values'; and this theme of stakeholding is echoed by Ruohonen in 1991 and Sauer in 1993.

Theme 5

Other

Other views and definitions that have been offered but have not proved popular are 'those with a legitimate stake' or 'claim' (MOD 1988, Hill & Jones 1992); 'actors' or those whose 'actions can influence' (Lewis 1994, Pouloudi & Whitley 1995); 'claimants of organisational effectiveness' (Mendelow 1984); and 'decision-makers' (Smits 1995).

By cross-linking dictionary definitions with the literary themes identified above, the five themes can be refined into two major camps, that of:

stakeholders as realisers of goals (personal)

and

stakeholders as those with vested interests.

What is clear is that there is no commonality of meaning or theme apparent in IS or SPIS writers. With this diversity of meanings miscommunication is easy. The meaning of the phrase as used in literature is entirely dependent on what the recipient understands it to mean and in SPIS literature this can lead to confusion and inappropriate action by any reader or author who uses the term without exploring its meaning in the way is has been here. The context of a word should dictate a commonality of meaning.

2.7 A Definition for CIS/SPIS Development

Below is derived a new definition for use in this study and the SPIS Framework proposed that would also be useful in the field of CIS generally.

If one goes to the original dictionary definitions of the lexemes (see Chambers 1993), 'stake1' (pole) clearly has no relationship to the theoretical definitions offered by managerial, organisational and CIS development theorists . 'Stake2' (to deposit as a wager) seems at first glance to bear little relationship either. However if one combines the lexeme 'stake2' with the lexeme 'hold1' (to keep), one obtains a word that implies the keeping of a deposit (in an organisation) as a wager, or the holding of an interest as a

gamble (against future developments). A definition of the word 'stakeholder' that combines both dictionary correctness and pragmatics for CIS/SPIS development would therefore be:

> A person who holds an interest (personal or otherwise) in a CIS/SPIS development.

This interest is kept as a wager (a wager being something staked on an outcome not yet known, see Collins 1993). This would refine into:

A person who has an interest in a CIS/SPIS development in anticipation of (in expectation of) the possible future outcomes of that development.

In using the word stakeholder in future chapters of this study, it is the author's new definition of meaning, derived as shown above, that will be used.

2.8 Conclusion

This chapter has reviewed the development of the usage and contexts of the word 'stakeholder' across a number of fields of study. It has tried to identify the problems associated with the meanings allocated to words and the potential for miscommunication that this might offer. In the literature reviewed in the chapter and Appendix One, clearly there are several meanings of the word 'stakeholder' in common usage across the fields of study and viewpoints from which stakeholders can be studied. A consensus of definition has not been achieved. It is shown that context is important when understanding meaning.

In the interest of clear understanding of the term when used in the context of CIS/SPIS development, a new definition has been offered in Section 2.7 above. This definition addresses both the issue of semantics and pragmatics. The phrase combines both dictionary correctness derived from the lexemes that comprise the word 'stakeholder' and the context in which it is employed. This definition is not in opposition to the major definitions offered by theorists in the organisational and managerial fields of study, many of whom draw from the work of Mitroff and Emshoff (1979) and Freeman (1984). This definition is also not in opposition to those writers in the CIS field of study who draw

from the work of Mason and Mitroff (1981). It offers instead, a clarification and specificity to the situation that enables the context or domain to influence the meaning.

In the literature reviewed, particular emphasis was placed on the concepts discussed within Business Ethics, especially those relating to Feminist Philosophy. In the work of Gilligan (among others) it was pointed out that an organisation is a network of stakeholders both within and without the organisational boundaries – a web of relationships was in place. This web of stakeholders holds knowledge of, and for, the organisation and its activities, past, present and proposed, that it is necessary to retrieve for a sufficient SPIS process. Thus in Chapter Three the concepts of knowledge management in a complex environment are discussed and a visual tool to map this web of stakeholders is introduced in Chapter Four and used in Chapter Five to illustrate the organisations under investigation.

CHAPTER THREE

Knowledge and the Complex Environment

3.0 Introduction

This chapter considers the notions of the learning organisation (and therefore also the 'forgetting' organisation) and how knowledge management, as it has become known, can be used to enhance the organisation's awareness of the environment in which it operates and its own capabilities to react appropriately. Any organisation that intends to put in place a strategic plan, whether for the overall organisation or for the information systems that support the business objectives, needs to understand, to the best of its ability, the environment in which operates. This refers to the argumentation in Chapter One where it was said that stakeholder knowledge missed will infer inappropriate projects can be chosen and thus systems may be planned that will fail or never be implemented.

This organisational environment is turbulent and, using notions from systems and complexity theory, this chapter shows how open systems such as organisations are subject to feedback that causes disorder and deviation from expected outcome. Organisations need therefore, to learn in a continuous manner and, through the knowledge they thus develop, to respond to the turbulence. Turbulence or change is important in an organisation and eradication by control is inappropriate. The organisation needs to use turbulence constructively, learning or adapting as changes arise. Covey (1994) says that for organisations to become more competitive they need to become more comfortable with change as managers' underlying paradigm of control is a cause of their own undoing and fear.

This chapter therefore also discusses how knowledge gathering within organisations assists in the planning process and alleviates the issues relating to bounded views and systems that may undermine the potential for adaptation and learning. Boundaries of systems (and here is included organisations) are set by theory and history, both of past experience and people mindset. Such boundaries, if rigid, are frequently invalid in the complex and often chaotic environment. Rigid definitions miss many dimensions of

system boundaries as shown in Section 3.5 and as argued in Chapter One. Any planning process needs to consider this need for flexibility and cannot assume the traditional plan-develop-use cycle. In the framework developed, this issue is considered and allowed for in the cycle proposed.

Thus complexity theory helps us understand how the web structure of stakeholders in a complex organisation can co-evolve and produce an ever-changing system of relationships and ever evolving systems.

3.1 Knowledge or knowing

Most of us approach life with knowledge, knowledge being what we have learned, what we have been taught, and what we have gathered in the incidents and accidents of life. This knowledge becomes our background, our conditioning. It shapes our thoughts; it makes us conform to the pattern of what is known (Krishnamurti 1994).

The knowledge that we have, whether as individuals (or stakeholders in an organisation) or as is jointly held by the organisation, has boundaries set by past experience and activity and is therefore limited, fragmented, incomplete and always couched in the past. Our current actions must therefore be limited by our incomplete knowledge and our history. The challenge to both individuals and organisations is how to expand and transcend these limitations and to perform current and planned actions without ties to past knowledge and experience. We must learn from the past but not to the extent that it dictates the impossibility of change. A turbulent environment requires flexibility and adaptability and the capability for development.

Below is discussed the idea of the learning organisation in a complex environment, but first it is necessary to explore the concept of knowledge for the individual as all organisations are webs of individuals (see Chapter Two and the discussions relating to Feminist Philosophy under Business Ethics,) and it is the sum of the network of the relationships between these individuals (and thus between their individual knowledge) that builds into organisational knowledge. An individual that learns and manages his or her knowledge, and that is inter-connected to other individuals in the organisation, also develops the organisational knowledge and thus many learning individuals may also imply

an organisation that learns. It would seem therefore likely that organisations hold most of their knowledge within the informal communities that develop within and thus is proposed a SPIS Framework (described in detail in Chapter Six) with tools and techniques to assist in identifying these communities and their communication links and of retrieving the knowledge held, in order to capture knowledge relevant to the SPIS process wherever it is located. What therefore is this knowledge?

3.1.1 What is Knowledge?

> "An ounce of information is worth a pound of data. An ounce of knowledge is worth a pound of information. An ounce of understanding is worth a pound of knowledge." (Ackoff 1991 p170).

There are many definitions in the literature as to what knowledge consists of, the ways in which it can be codified and the ways in which it can be distinguished from data and information. The use of knowledge is however, as Ackoff points out, only as good as the user's understanding of what that knowledge means. Knowledge without understanding is not very useful. Understanding comes from a number of attributes both of the knowledge itself and the format in which it is utilised and the previous experience of the user. A useful framework of the categorisation of knowledge can be found in Blumentritt & Johnston (1999) from which the table below has been abstracted. This table indicates some of the attributes for knowledge that build up into understanding.

Table 3.1 Framework for Categories of Knowledge

Codified Knowledge	Common Knowledge	Social Knowledge	Embodied Knowledge
Of things and objects Musgrave (1993)	*Embedded* Blackler (1995)	*Know who* Lundvall (1996)	*Embodied* Collins (1993) Blackler (1995)
Know what *Know why* Lundvall (1996)	*Embrained* Blackler (1995)	*Social* Millar, Dermaid & Quintas (1997)	*Tacit* Fleck (1997)
Explanatory Millar, Dermaid & Quintas (1997)	*Experiential* Millar, Dermaid & Quintas (1997)	*Encultured* Collins (1993) Blackler (1995)	*Know how* Lundvall (1996)
Catalogue Millar, Dermaid & Quintas (1997)	*Informal* Fleck (1997)		*How to do things* Musgrave (1993)
Symbolic Collins (1993)			*Process* Millar, Dermaid & Quintas (1997)
Encoded Blackler (1995)			
Formal Fleck (1997)			
Explicit			

There are thus (according to Blumentritt and Johnston) four main categories of knowledge – codified; common; social and embedded. Within an organisation we can see each operating in its own, different way. Codified knowledge is to be found in the documents and computer information systems; common knowledge is in general circulation in the organisation; social knowledge is contained in the cultural organisational norms; and embodied knowledge is contained in the individuals and is a result of their individual experiences.

Codified knowledge is explicit and:

- can be precisely and formally articulated;
- is easy to transfer, share;
- can be placed in, and discovered in documents etc.

Social and embodied knowledge are tacit in nature and are:

subconsciously understood or applied;

difficult to articulate;

developed from direct action and experience;

shared through conversation, story-telling etc.

Common knowledge may be of either form whether tacit (social or embodied) or explicit (codified) depending on what type of common knowledge it is and sometimes it is both social and codified. For instance the knowledge that the boss likes sugar in her tea may be written down or it may be carried in the head of the person who normally makes the tea, who may also know the temperature at which the tea should be served, the colour of the brew, which type of tea, at which time etc. This typology of knowledge (tacit v explicit) can be expressed as:

> "Explicit is systematic and easily communicated in the form of hard data or codified procedures. It can be articulated in formal language including grammatical statements. This kind of knowledge can thus be transmitted across individuals formally and easily. Tacit knowledge is not available as a text and may conveniently be regarded as residing in the heads of those working in a particular organisational context. It involves intangible factors embedded in personal beliefs, experiences, and values." (Pan and Scarbrough (1999, p362).

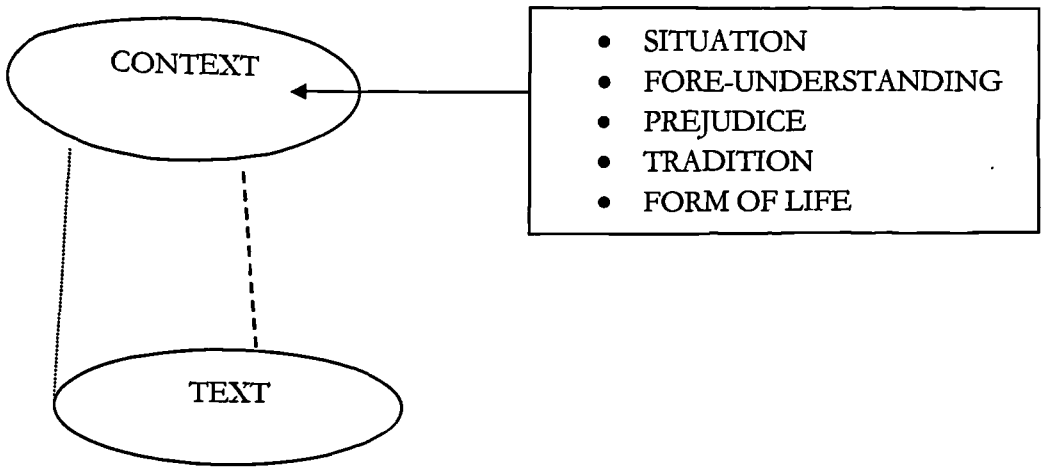
In any organisation it is the tacit – the social and embodied knowledge - that is most difficult to retrieve, and to know what is known, as it may not be recognised as such by the person holding that knowledge. Yet it is this knowledge that, in any situation of complexity, it is necessary to discover in order that a more complete representation of organisational knowledge is obtained. The framework discussed in later chapters addresses the issue of how to retrieve (as far as feasible) social and embodied knowledge during the process of SPIS.

3.1.2 Knowledge and Understanding

To return to Ackoff's quotation above, knowledge without understanding is only a part of the equation. Introna (1997) discusses the various parts of the equation in his writings on the hermeneutic circle. Hermeneutic circles being a way of understanding the decision-making process that humans undertake. Introna (1997) argues that information must change the recipient; it must lead to a level of interpretation and understanding. The hermeneutic circle is the dialectic process of understanding.

Hermeneutics can be considered the philosophical grounding for interpretivism (Myers 2002). It is concerned with the meaning of a text or text-analogue (eg an organisation) – it is an attempt to make sense of an object of study to provide an underlying coherence (Taylor 1976). Introna (1997) says that the hermeneutic circle permits an understanding of multiple perspectives. The first interpretation of the text is based on current understanding (or prejudices and thus is bounded by experience). If the text is not coherent and understandable than a new perspective must be employed. This new perspective permits a new understanding and thus gives the text a new meaning leading to a further expansion of understanding. The more reiterations of this process, Introna argues, the more comprehensible the text becomes and the greater the understanding that can be achieved (see Figure 3.1 below). Gadamer (1976) explains this as being a circular relationship.

Figure 3.1 The Hermeneutic Circle (interpreted from Introna 1997)



The Hermeneutic circle starts in a heuristic manner, the interpreter uses fore-understanding and prejudices to establish the actual meaning of the text. (See comments later in this chapter on boundaries and bounded thinking.) This meaning is then related to the current situation, tradition or form of life. This provides a new understanding of the context, which is projected back onto the text and permits further meanings to be projected back to the context.

Hermeneutics is also practised in everyday settings (Boland 1984) when we 'read' other people and understand each other in normal communication practice. We interpret their communications according to our understanding and preconceptions – people behave in ways that they think are rational responses to the current situation (Doktor, Schultz & Slevin 1979). However, this knowledge is incomplete as discussed above, and so there is a need for constant scanning of the environment both internal and external to update imperfect knowledge - whether tacit or explicit.

It is essential that some suggestions are promulgated that lead to organisational knowledge being used for timely decisions which lead (amongst other things) to true competitive advantage for the business. The emerging focus in management and systems literature on the importance of organisational knowledge is according to Prusak (1997) due to six changed specifics for organisations. These specifics - the pace of change itself (fast); the nature of goods and services (an increasing emphasis on intangible goods); the

scope of the typical firm and its market (ever-increasing with the increasing use of the World Wide Web); the size and attrition rate of employee bases (shrinking or growing according to the market forces); the structure of organisations (under change as circumstances change and thus increasingly fluid); and the capabilities and costs of information technology (increasing capabilities for decreasing costs); affect most of the organisations operating in developed economies and often many in the developing economies too.

Taylor (1998) suggests that the real problem is not acquiring that knowledge, but that "organisations will need the skills to interpret this material to make effective decisions", and that this can only be achieved with people.

> "People will be the biggest factor in determining the success or failure of knowledge management by the quality of their decisions" (Taylor 1998 p26).

Thus we see the importance of the hermeneutic circle and the retrieval of tacit knowledge. What is also important when retrieving knowledge is an understanding of where the system or organisation's boundaries lie. Below in Section 3.5 is discussed the issues relating to boundary definition under complexity, but first the ideas of how organisations can learn and achieve a hermeneutic circle are discussed.

3.2 Learning Organisations

When referring to knowledge in organisations, it is clear that organisations must continually be updating, expanding and developing their knowledge as a result of their experiences and, that at any time, any action taken cannot result in easily predictable results. The order being experience, knowledge, memory, thought and then action. Thus any action may have unanticipated and unexpected results, as all knowledge is imperfect. Imperfect or incomplete knowledge is all we are ever going to be able to work with, but nonetheless the more complete the knowledge the more likely we are to make decisions that have a chance of success. Failure as Sauer (1993) says is, however, particularly in complex systems, multicausal resulting from a complex set of factorial interactions including the technical and human, which are set in a social situation.

We thus see how a sociotechnical viewpoint can assist in discovering the sources of these failures. Collective organisational learning requires trust and interdependency amongst individuals and semi-autonomous organisational teams, and thus organisations operating under sociotechnical principles (see the discussions in Chapter One) are more likely to demonstrate organisational learning than those operating without such principles.

It cannot be said that organisations are knowing entities in the way that living beings are, yet organisations can 'know' their environment and their own capabilities and can build on this knowledge in the way living organisms do. In a living being's brain new information received is related to, by a constant search, patterns of past experience, and thus knowledge of what this information means, and how to react to it, is retrieved. This can be both a welcome or unwelcome fact as past experience is not always accurate in telling how reactions should now be performed. Indeed past experiential knowledge can be a hindrance when new situations arrive, as old patterns of behaviour emerge and are inadequate. Knowledge without learning is insufficient – see the discussion relating to Bounded Realities below and Hermeneutics above.

Kransdorff (1998) argues that a learning organisation is one that has consciously elected to purposefully and systematically manage, the knowledge that it holds and creates, thus enabling employees to discover how and why they should change, or create new, realities to corporate advantage. Organisational memory shapes today's performance and conditions tomorrow's experiences. Thus a 'forgetting' organisation has corporate amnesia. In Kransdorff's views there are two types of corporate amnesia. The first is associated with negative experiences that generate a defensive reaction whether conscious or unconscious – that cause memory loss or factual distortion. The second type of amnesia occurs where there is disinterest in the topic or a lack of ability (or facilities) for recall. This evidence of corporate memory loss is backed up by studies by Kantrow (1984) amongst others.

In Senge's (1990) view, learning provides the organisation, and the individuals within it, with the opportunity to change their external perception of the world and to be creative. It helps to 'break' the boundaries and bounded thinking set by previous experience. A learning organisation will have a structure and form that promotes inter-dependency and

trust, most likely through semi-autonomous teams. Additionally, informal communities (or Communities of Practice) may emerge for the purpose of sharing knowledge and assisting in the learning function and in the prevention of the 'forgetting' process.

Several authors have addressed the problem of finding structures for learning or flexible organisations. Muller and Watts (1993) identify two approaches to coping with business environment turbulence:-

modelling - inventing and designing new concepts of organisation; imagination and vision; systems design and experimentation

or

muddling - evolution towards the unknown; incremental adaptation; learning and surviving; trial and error, heuristics.

Both approaches to coping would indicate an organisation that learns from experience. The difference being that the 'modelling' organisation plans its own transformation. It has a view of where it intends to go and how it intends to get there. This implies strategic thinking and an in-depth knowledge of the environment in which it is operating. The 'muddling' organisation, on the other hand, may also have strategies but these strategies are based on an incomplete knowledge of the environment. Thus it reacts rather than behaves pro-actively. It evolves in the manner of organisms, where external influences are the prime drivers for new forms and adaptations (like the black ladybird in polluted cities). The 'issue' with muddling as opposed to modelling is the implied lack of control or organisational direction. Strategic theorists of all schools of thought implicitly believe that organisations need to control activities to some degree or other in order to exploit opportunities and become 'better' organisations in whatever field they operate. The difficulty of course, is that whilst organisations may be able to control their own activities, they have little control over the external environment and thus even the most 'knowing' organisation can find itself being overtaken by key events or unexpected happenings in the external environment.

Argyris & Schön (1978) identify a different dichotomy in learning organisations - the single loop and the double loop. The double loop organisations are those which resolve incompatible norms by setting new priorities or restructuring (modelling) and the single loop organisation type respond to changes in the muddling fashion - they correct errors as they detect them, whilst maintaining their central norms unchanged. Argyris (1980) also discusses the concept of duetro learning, which is a continuous process whereby single-loop and double-loop learning activities are interchangeable. Thus allowing for adaptation and perhaps the emergence of new knowledge.

In Becker & Dorfler's (1989) terms, the systems that the modelling organisation creates are dynamic (subject to lasting changes) and the muddling organisation's systems would be iterative (where the laws that govern their behaviour can best be described by feedback). They would say that 'negligible changes to quantities that are coupled by feedback can produce unexpected chaotic effects' in such systems.

The concept of the learning organisation is crucial to the idea of balancing on the edge of chaos. The organisation that successfully balances at this most creative point is one that learns from its experiences how not to fall over into the abyss. Those who do not learn, fall over the edge and struggle to make sense of their environment and the conflicting forces that are pulling on them. Learning organisations make sense of their environment and have knowledge about this environment as well as their own capacities and capabilities. The knowing organisation is also a learning organisation as understanding creates the capability to explore and the confidence to take risks. Uncertain organisations hesitate when opportunities come their way and often mistake the nature of what is offered to them, thus refusing to take risks, or taking them too late, or in an inappropriate or untimely manner. This is shown later in the second case study in Chapter Five.

Sometimes, however, it is necessary for organisations to fall over into the abyss of chaos in order that a radical change or re-structuring can take place. The learning that is required in order to climb out of the abyss can be beneficial in improving the organisation's knowledge of itself. The emergence of order from instability can lead to a breakthrough to a new level of evolution.

The concept of organisational learning is also informed by Pask (1961) in relation to his work on cybernetic theory and adaptive control systems. Pask says that the variety of potential actions available to the system controller must be at least as great as the variety of the potential fluctuations that might need to be corrected (the law of requisite variety). He goes on to say that the amount of control (as measured by variety) depends on the amount of information that can be discovered from the environment. Pask's view is confirmed by complexity theory which tells us that simple objects or agents can act on each other to create elaborate and unexpected behaviour. This leads to emergent behaviour where solutions evolve rather than are created, and complex adaptive systems create diversity rather than monoculture (Kauffman 1995). Successful evolution of organisms is a result of emergent behaviour. Thus:

> "If a system has a sufficient degree of internal complexity, randomness and diversity and instability become resources for change. New order is a natural outcome." (Morgan 1997, p263).

Order is emergent, it evolves as does form. It cannot be imposed and there are no end states. Emergent behaviour and evolution towards end states (which are in continual change) are now becoming common discussions in the organisational behaviour field, however, in considering organisational responses to complexity it is necessary to explore the concept of bounded thinking, as it is bounded thinking that prevents creativity from taking place in an organisation.

3.3 Bounded Reality

Organisations naturally believe in the program logic model where an original event predicts the immediate outcome and, over a period of time, the intermediate and ultimate outcome. Plans are made with this assumption as a default. Yet chaos theory shows that we cannot predict even the immediate outcome let alone the ultimate one. This taken-for-granted way of thinking is discussed in cognitive management theory (Burrel and Morgan 1979; Morgan 1997; Weick 1979). Traditional mindsets, it is said, have set boundaries that do not fit to the 'post-capitalist' society (Drucker 1993).

The idea of bounded reality, where managers in an organisation create their own environment; was put forward by Weick in 1969 and 1979 where he considered the

psychological and sociological implications of how managers operated at work in their organisations. It has also been noted that managers within organisations operate within a situation of bounded rationality (March & Simon 1958). This concept of bounded reality relates also to the notion that knowledge is formed from past experience and is therefore limited and fragmented (see the earlier discussion).

Weick discusses the interactions between managers in terms of feedback loops within the systems that operate in organisations. In his systems there are both positive and negative feedback loops and there is also an implicit recognition of non-linear relationships that cause loops to change from dominant positive to dominant negative in an autonomous manner. How events are reacted to and what actions are taken as a result are, according to Weick, a result of the feedback loop that is currently in operation and that defines the relationships in the system under consideration. Decision making is not, therefore a rational process, it has underlying psychological implications and considerations that are not easily detected and allowed for (see the earlier discussions on Hermeneutic circles).

Weick also considered the relationship between the actors within an organisation and the environment external to that organisation and that there were feedback loops that reinforced behaviour within the organisation. People, according to Weick, do not merely react to the environment. Nor do they anticipate or adapt to what the environment can be objectively observed to do. In fact they act according to what their subjective perceptions of what those acting in the environment are doing or might be expected to do. The internal organisational actors' actions may, in fact, cause the external environmental actors to behave in that manner expected of them, as this would then be a positive feedback loop. So actors create the environment they are expecting and the environment acts in the way that they believe it should. Their perceptions are influenced by what has happened in the past and this reinforces current behaviour and beliefs about what should happen in the future.

Actors (managers), within an organisation, retain a shared memory of what has been perceived and learnt from previous actions, and tend to behave in a manner consistent with past 'good' actions. Past actions that are seen as 'good' will be ones that conform to the organisational culture and paradigm. Mental models are built up from previous

experience that is shared within the organisation. There is a social unreality of management - managers don't know what they know and what their implicit knowledge is.

If, as stated above, managers create their own reality and their environments through feedback loops, it also possible that these loops may be either vicious or virtuous circles, or self-fulfilling prophecies; chain reactions and bandwagon effects may take place. Because managers cannot predict exactly what will happen as a result of their actions, they attempt to explain what has happened retrospectively, to give meaning after the event has taken place. In fact, they could be considered to assist in causing the uncertainty of the environment and may, in fact, be part of the reason for environmental chaos.

Changing the managerial worldview is a more complex task than might be realised as shown above and:

> "...when the world changes, managers need to share some common view of the new world. Otherwise, decentralised strategic decisions will result in management anarchy."(Wack 1985, p89).

This causes a number of difficulties both in perception of the external environment and in performance of appropriate behaviour in reaction to the perception. Partly this is because managerial expressions of decisions and needs are not optimal or even purely rational but constrained by past and present experiences; partly because managers to some extent create the environment that they react to (Weick 1977); and partly because managers do not necessarily have all the information they require to make optimal decisions. Decisions will always be made with incomplete knowledge and under circumstances of interpretation of information according to the needs of the supplier of that information. (See issues relating to the power and politics of information gathering and sharing as discussed by Davenport, Eccles and Prusak 1992.)

In addition, by their very nature, complex open systems such as organisations and their environment are unstable and unpredictable. If we are to manage the SPIS process more effectively we need to begin with a clearer understanding of the sources of unstable and unpredictable behaviour, that is to understand order we must first understand disorder.

The following section looks the concepts of autopoiesis and complexity and how they can be applied to the concept of the learning organisation.

3.4 Organisations, Autopoiesis and Complexity

The concept of autopoiesis was developed by Maturan and Varela in their book of 1980. Autopoiesis is an idea developed from biology stating that all living systems are originally closed autonomous systems of interaction that make reference only to themselves, and thus contrasts with General Systems Theory where systems would be considered open. Autopoiesis would say that the idea that systems are open to the environment is the product of an attempt to make sense of such a system from the standpoint of an external observer. However on further exploration General Systems Theory and Autopoiesis are not as far apart as at first glance.

Living systems have three principal features: autonomy; circularity and self-reference. These features lend systems the ability to self-create or self-renew; the idea of self-production through a closed system of relationships. The aim of all living systems is ultimately to produce themselves and thus their own organisation and identity is their most important product.

The circular patterns of interaction whereby change in one part of a system is coupled with change elsewhere is always self-referential, for instance, dead-head your flowering plants and the plant will produce more flowers somewhere else, in order that it might complete its task of producing seeds for self-reproduction. Systems thus react with their environment in such a way that it facilitates their own self-production, to the living system the environment is an extension of itself. Where therefore does the system begin and end? Circularity again is part of the equation, the maintenance of self is also the maintenance of other systems. The environment is clearly part of the system, thus changes do not arise as a result of external influences but are a result of the overall system varying and altering. Autopoiesis would therefore have difficulty in discovering system boundaries between organisations and their environments and would argue that they are part of the same overall system and are circular in their effects.

Given the combination of the chaos inherent in the development and operational environment of the IS and the complexity of sociotechnical systems, predicting through planning, consequences for the future of systems within organisations becomes problematical.

If we note the statements Çambel makes about complexity (1993) we can see that organisations, which are the environment within which SPIS takes place, have several problems related to their complexity. In summary we must expect them to be dynamic, and synergistic and frequently, unpredictable in their system behaviour. In a recent paper Dhillon and Ward (2002) argue that Chaos Theory is appropriate for studying IS for three reasons:

Firstly; the long-term future of an IS is inherently unpredictable;

Secondly; predicting the outcomes of change caused by the implementation of an IS is difficult if not impossible;

Thirdly; they argue that the notion that the success or otherwise of an IS is a function of adaptation to the environment is too simplistic.

Parker and Stacey (1994) identify feedback loops to be particularly sensitive when the organisation is undergoing a period of special stress. This 'phase transition' period can often be caused by factors such as the development of a new technology or IS. During a period of 'phase transition' organisations will often change and amend their ways of reacting to events, which will in turn cause turbulence within the organisation as people attempt to adjust to the new situation. Much of the turbulence will be caused by problems associated with information politics (Davenport et al 1992); power games (Morgan 1986); and resistance to change (Markus 1983); that are common in situations of threat. Organisations change in order to become more competitive in the new environment and adopt change paradigms according to internal culture and interpretation of events.

However, as Capra (1998) notes, there are issues with the structures and forms imposed by organisations. The greater the degree of centralisation, the more complexity is increased and therefore the opportunity for chaos to ensue is also increased. A loose, flexible structure may alleviate complexity as it can react faster, and with fewer

reverberations, to change. Diversity assures resilience. The role of the organisational leadership is to facilitate the emergence to new order and this is most effective where there is a distributed chain of command across the community.

Autopoiesis and complexity would indicate that there may be issues relating to how (system) boundaries are set for an organisation and this is discussed further below.

3.5 Systems' Boundaries

An organisation is traditionally defined as a system of mutually dependent variables; systems being considered entities with boundaries that define them. More recent system theory approaches have emphasised the holistic nature of such systems (Checkland 1981) and the necessity to consider external influences on systems such as organisations when considering their activities. This approach can be traced back to the Greek origin of the word 'system' which is syn histanai - to set together. Systemic thinking implies that the understanding of systems requires that they are put into their context and the nature of their (inter)relationships are understood. Indeed some information systems theorists have concluded that the correct context in which to consider computer information systems is that of the organisation and not that of the process that is defined by the (potential) computer activity (Lewis 1994). However, a rigid definition of boundaries of influence and applicability by any means, whether it is by the process of the computer activity or by the organisation would seem mistaken. It leaves out several dimensions within which organisations and systems operate, in particular time and space.

It is now accepted by those working in quantum mechanics that systems cannot be stable over time nor can they have a stable boundary in space. Any order produced at any one time is at the expense of greater disorder elsewhere as disorder is the natural state of being or direction of change (Thuan 1995). The Uncertainty Principle tells us that there is no predictable, absolute outcome but a range of possible outcomes. Chaos theory emphasises in addition the unexpected nature of these outcomes that result in particular from non-linear systems such as organisations. It is therefore unreasonable to model completely organisations as systems and to define boundaries to their influences and activities and expect these models to maintain validity over time and space.

Complex dynamic systems involve uncertainty due to incomplete or missing information, the boundaries of such systems being unstable and transparent, as well as incomplete or disputive, according to individual perceptions.

Below are discussed the major issues relating to boundary drawing under complexity.

3.5.1 Ambiguities in boundary drawing

In addition to the issues with defining boundaries shown above, it has also been noted by a number of authors that there are ambiguities in boundary drawing.

Traditionally, generic strategy management planning processes have suggested, amongst the use of other models, using the Porter Five Force analysis (1985) of supplier; new entrants; buyers; substitutes and industry competitors. More recently the Value Net (Brandenburger and Nalebuff 1996) has suggested a change from the Five Force model in that it considers customers; complementors; competitors; suppliers and the company. Complementors are considered important – they are organisations which supply complementary products or services or to which your suppliers can sell such complementary products. Complementors increase the buyers' willingness to pay for products. In the Higher Education (HE) industry, complementors could perhaps be considered the newspapers and their League Tables or the QAA and RAE and their rankings of universities which increase students' desires to attend (or not) various universities according to their rankings in particular subjects. The concept of complementors implies that organisational boundaries must now extend to include these organisations in the external environment - the boundary thus becomes more fluid and likely to be less stable as these complementors can be expected to change over time.

Ghemawat (2000) describes the remaining ambiguities in drawing planning boundaries as revolving around the horizontal, vertical and geographic axes. The horizontal axis relates to product markets and issues of substitution and complementarity are of greatest importance here. So a university would need to consider other universities and their courses and the Government agencies that perform the rankings within universities. The vertical axis looks at the supplier-buyer chain and the stages within it and asks "can/should any of the links and stages be unlocked?" For a university looking at IS this

might mean purchasing a software company that provides it with essential software. The geographical scope or axis requires the organisation to look at the environment in which it operates and to choose its geographical boundary - for most universities this boundary is world-wide as students are drawn from all (or nearly all) countries in the world. The Stakeholder Web (discussed in Chapters Four and Six) is useful here to identify these axes.

In Chapter One the process of SPIS was discussed and the issues with the suggested methods for performing this activity but this ambiguity in system boundaries is also seen in IS planning methodologies where the 'big' picture is not considered and concerns are limited to the system under design. IS planning here being the subset activity of the SPIS process without which the plan cannot be put into place. For example in ETHICS (Effective Technical and Human Implementation of Computer-Based Systems) as described in Mumford (1983a; 1983b; 1995) – the design group identifies the boundaries of the system and where it interfaces with other systems. This view of the design produces a limiting viewpoint that looks at a specific business area, the technology for that area, that part of the organisation and that part of the environment relating to that segment of the organisation's work.

It is important to note here also the alternative views on IS planning where the view of the planners is limited by their internal worldview of how the organisation and its environment operates, exemplified by such methods as Information Engineering (IE) (Martin 1989; Martin and Finkelstein 1981). IE sees data at the centre of an IS, where business objectives are analysed for information needs and priorities and IS strategy planning is done by user management and IS staff. Clearly, this again limits the boundary that is contemplated.

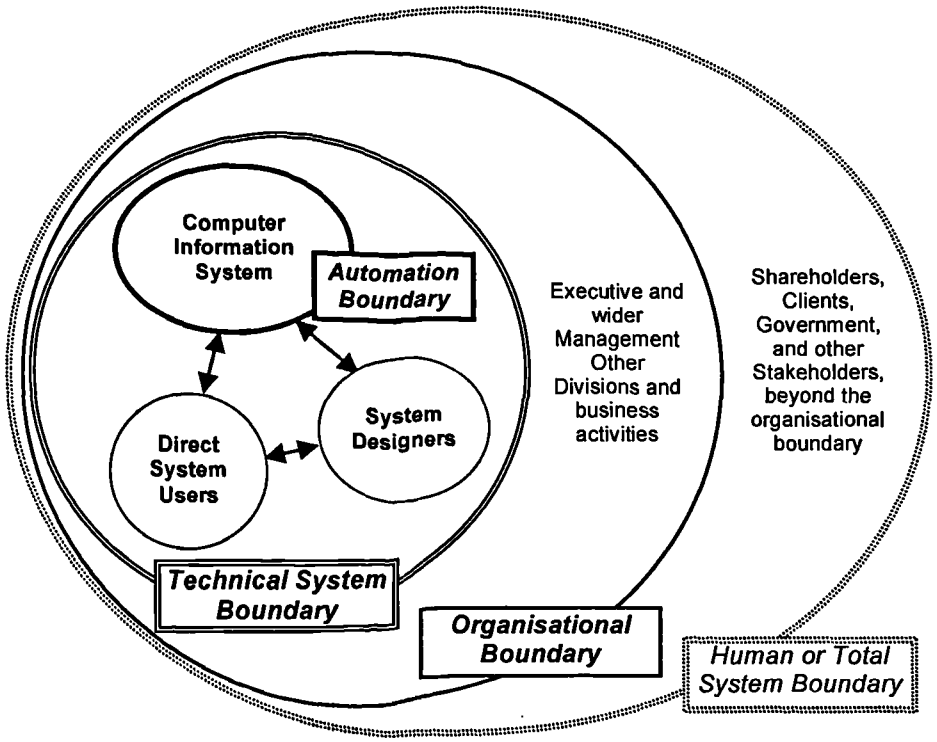
3.5.2 Setting the boundary

Churchman (1970; 1979) considered the boundary of analysis to be crucial. That which is an improvement in systems terms when a narrow boundary is considered, may not be an improvement when the boundary is extended. Thus boundaries should be considered in the human view as social or personal constructs and the systems are thus defined by this

view and not by those parts of the system whose behaviour and interaction we can control. Extending the boundaries of the system in this manner will also extend the possibilities of who might be a stakeholder in the system under consideration and will also extend the knowledge that is retrievable.

Ulrich (1983) while acknowledging Churchman's viewpoint takes the view that practical action will lead us to define the system in terms of its automation or technical boundaries as shown in Figure 3.2. Boundary judgements are linked to the values held by the drawer of these boundaries and thus boundary drawing will become an ethical activity. Whilst the boundaries advocated by Ulrich are not considered here, to be sufficient, the concept of boundary drawing through an ethical stance underlies the sociotechnical perspective taken therein. Midgley (1992) criticises the technical and automation setting of the boundary and points to an alternative perception as indicated by the Total System Boundary as shown in Figure 3.2. This critical setting of the system boundary, determined by examining the viewpoints of stakeholder groups involved in the system, refocuses attention on people and the organisation rather than technical issues.

Figure 3.2. Choice of the System Boundary (after Midgley 1992)



Yolles (2001) considers the work of Midgley and extends it into viable systems theory to provide for a more complex situation that permits analysis of cognitive, ideological, ethical and behavioural boundaries. Viable organisations can maintain stability in their behaviour while at the same time supporting adaptability and change, in particular in relation to external environmental change. The organisation is self-organising and thus can deal with the requisite environmental variety (see above for Pask's discussion on requisite variety). Viable boundary critique as explained by Yolles (ibid) provides a way of exploring problem situations as ideologically or ethically conditioned conflicts. Individual actors are explored for potential and differences are acknowledged by the drawing of (often) conflicting boundaries. Thus viable boundary critique is concerned implicitly with participation and enfranchisement of stakeholders.

The messages of participative design and enfranchisement of interested parties are well documented (Bjerknes & Bratteteig 1995; Doll & Torkzadeh 1989; Hirschheim 1983). However, the mode of consultation and the breadth of the franchise are often left to the CIS/SPIS developers once a corporate change is initiated (Igbaria & Iivari 1995; Spinas & Ulrich 1998). Ease of identification and access may in this manner focus on direct users and immediately affected internal departments as the stakeholders to be consulted in such a change. Although these people are readily identifiable, and easily drafted into the process, it fails to extend significantly beyond the technical boundary.

A particular risk is that close to the technical boundary we will find stakeholders who have extreme views of existing systems. The danger is that inappropriate factors may be given more weight than the wider needs of the organisation and its environment. Stakeholders close to the technology can be expected to express their personal investment in the current technology, their detailed experience of operational problems, or their technological bias lending enthusiasm for the promises of new technology. Both strategic planning for IS and detailed development of particular systems and business processes need to see the relevant technical system in terms of its wider context, not just within the organisation but also beyond the confines of the organisational boundary.

3.5.3 External Influences

Paul (1993; 1994) argues that business and economic systems are dynamic and that information systems development paradigms need to acknowledge the lack of a static reference point. He identifies six environmental changes that have the potential to affect an organisation's CIS/SPIS needs:

1. Changes in legal requirements;
2. Trends in the industry sector;
3. Changes in the broad economic environment;
4. Changes in public attitude, expectation, taste or climate of opinion;
5. Changes in internal management style;
6. Changes in internal organisational structure.

An organisation's planning processes need to be continually informed of these demands and this can often best be achieved through the inclusion of external stakeholders in the planning process. The difficulty comes from stakeholders in other organisations or the wider community not being directly accessible. Therefore, the formal planning structure must provide some voice for these interests and ensure that their needs are given due weight. This study contends that the structure will need individuals who, by proxy, negotiate on these stakeholders' behalf. Further, unless the intent is to simply satisfy a stakeholder's demands, or at least accept the consequences of a unilateral decision, some form of dialogue will be needed. In some cases, the public face - that seen by those outside an organisation - of a CIS/SPIS may be as important as its principal internal products and services.

The choice of boundary location for systems and strategy delineates who is within and without the sphere of influence of either the strategy or the project. Thus it influences the choice of stakeholders who may or should be consulted within the planning process. The wrong boundary location and insufficient or incorrect stakeholders are consulted and inaccurate or incomplete knowledge may be obtained to make viable or 'better' decisions.

3.6 Conclusion

This chapter has discussed the theories that underlay systems theories, looking at complexity and its meaning for organisations. In addition, it has looked the ideas of knowledge and understanding that enable organisations to learn and make sense of the internal and external landscapes in which they operate. It has argued that without sufficient knowledge from organisational stakeholders the organisational fit to their operational landscapes is not optimal and that any systems developed will also not be optimal. Sufficient knowledge requires an organisation that learns and that determines system boundaries to encompass this sufficient knowledge for a better fit to their landscape(s). In the previous chapter a definition of organisational stakeholders was offered and in this chapter is shown the reason for including sufficient stakeholders within the SPIS process and for determining the system boundaries by their knowledge. The pre-setting of system boundaries for any purpose limits this stakeholder knowledge retrieval and thus inhibits the potential for success.

The idea that organisations learn and evolve, negates to some extent however, the idea of planning for system and strategy development. A strategic plan implies an in-depth understanding of what the organisation currently is, what it currently does and how it knows how to do it. Most people recognise, however, that the external environment cannot be predicted accurately far into the future as shown above, and thus, that all plans must have contingencies and the capability to flex as necessary. Notwithstanding, without the knowledge held by stakeholders, any form of planning cannot take place with any sense of validity.

In investigating the case study of UofB, described in Chapter 5, it was regularly mentioned that the set of stakeholders was like a 'web'. Each stakeholder was linked and related to others and to the system and plans under investigation (see also the discussion in Section 3.1 and Chapter Two relating to webs of relationships). Each strand of the web was circular and led back to stakeholders previously mentioned and discussed thus later a series of webs are drawn to reflect what was discovered during interviews with stakeholders or disclosed by documents in the case studies. This novel tool (the Stakeholder Web - described in Chapter Four and Six, and used in Chapter Five as story

illustration) provides a visual interpretation of the linkages perceived within stakeholders and the system(s) they are connected to.

The following chapter discusses the research methodology utilised in this study and describes the ontological and epistemological assumptions made. It discusses in addition, the development of the tools and techniques (including the Stakeholder Web) used for research purposes and later proposed as part of the framework developed for the SPIS process.

CHAPTER FOUR

Research Methods and Tools for Analysis

4.0 Introduction

This chapter discusses the methods used for discovery in this research project. This was briefly outlined in Chapter One but this chapter takes a sociotechnical stance on information systems study whereby it is argued that technical systems such as computer (based) information systems (CIS) and the process by which the organisation chooses which project(s) to undertake (SPIS), cannot be studied outside of their social context. The social context influences and constrains why, how, what and when, CIS are planned and implemented in any organisation. The activities of the SPIS process are thus embedded in the social and environmental context. The chapter therefore takes a mainly subjective approach to ontology, epistemology, human nature and methodology.

This research project crossed methodologies – and was trans-paradigmatic in nature. This was necessary because real-world situations, such as those investigated in the case studies of UofA and UofB, are complex and multi-dimensional. The research activities that took place were dynamic processes with differing phases (theorisation of problems; design of how to test; collection of data) that necessitated different techniques and activities. It is argued that adopting one paradigm alone to view the subject matter would have meant gaining a single (limited) view of the research situation. The issues relating to multi (or trans)-paradigmatic research (and thus paradigm incommensurability) are discussed below in Section 4.3.1.

Case study methodology is used to consider the historical antecedents and chronology of change within the two universities under study - UofB and UofA. Below is discussed the method (grounded data analysis) used for archival and document analysis and the corpus construction for stakeholder interviews. The case studies are described through organisational story telling which follows the model described by Davis (1993) as setting; build-up; crisis or climax; learning; and new behaviour or awareness. In Section 4.4.1

below, the background to organisational story telling as a means of understanding organisational behaviour is outlined.

This chapter also discusses artefacts (the Stakeholder Web and the Interaction Matrix) used as additional tools to discover the boundaries and stakeholders for the systems under study. These tools are, in Chapter Six, also shown to be integral to the framework proposed for SPIS and vital for knowledge discovery. The corpus construction of interviews in UofB is also shown in Chapter Six to be an essential part of the proposed SPIS framework.

4.0.1 The Sociotechnical Approach

Sociotechnical perspectives can be characterised as holistic, and whilst not being panoptic in character, take a more encompassing view of the organisation, its stakeholders in knowledge, and the environment in which it operates, than many other organisational views which are limited by their origins and paradigms.

The word sociotechnical, in its origins, is a combination of two paradigms - the social and the technical. It was thus intended to describe a broader view of the role of technology in an organisation than either paradigm could offer on its own. Technology, it was argued, should be seen, discussed and developed not just as a technical artefact but also in the light of the social environment in which it operated. This being the case it is therefore argued that the SPIS process (and the resultant CISs) under investigation must be studied in its organisational (social) environment and thus a case study approach was considered suitable for the research process.

The scope, effectiveness and validity of the research process are dependent on important criteria:

The epistemology (whether positive or interpretative);

The method of study;

The approach to data discovery (inductive or deductive);

The method of data analysis (qualitative or quantitative);

And whether one or multiple sites are studied.

Below these criteria are discussed and an interpretivist epistemology using case study methodology is demonstrated. Data discovery was performed using deductive methods and a qualitative analysis was performed on the data retrieved from multiple sites. Some quantitative analysis has additionally been performed on the reports from the Document Indexer utilised and this is discussed further in Chapter Six.

4.1 Research Methods

When investigating information systems operating within an organisational environment, one is, perforce, investigating social systems, irrespective of whether or not a computer is involved - a sociotechnical phenomena in the former case. It is therefore necessary to make assumptions about the social world that we are investigating. Assumptions that are both explicit and implicit. These assumptions according to Burrell and Morgan fall into four categories: ontological, epistemological, human nature and methodological. See Table 4.1 below.

Table 4.1 A Scheme for Analysing Assumptions about the Nature of Social Science
(Burrell and Morgan 1979 taken from Cohen and Manion 1994 p9)

The subjectivist approach to social science				The objectivist approach to social science
Nominalism	←	ontology	→	Realism
Anti-positivism	←	epistemology	→	Positivism
Voluntarism	←	human nature	→	Determinism
Idiographic	←	methodology	→	Nomothetic

When examining these sociotechnical phenomena undergoing their process of planning, one should also be cognizant of the fact that implementation of any information system, whether new or modified is, by its very nature, implementation of a change in the human and social systems that it impacts. Thus the process of planning for IS implementations (which is the end result of the SPIS activity) is also the process of planning for organisational change.

Below is discussed the assumptions made and that underlay the research project.

4.1.1 Ontology

The ontological assumptions concern the nature of the social world that is being investigated, whether it is, for instance internal or external to the individuals concerned, and is objective or subjective.

The philosophers who concern themselves with the objective viewpoint believe that objects exist independent of the individual and can be studied as such. This viewpoint traces its roots back to the Greek philosophers and is the basis of the scientific method of research. The scientific method selects from the total number of elements in any given situation thus (perhaps) missing important or relevant elements. This selection is performed in order that elements that can be subject to a quantitative analysis are investigated. By its nature therefore, the scientific method is reductionist.

Those philosophers of the subjectivist school of thought in contrast, believe that objects of thought are only words and are not independently accessible. The question to be answered is whether social reality is internal or external to an individual? In this study as demonstrated in Chapter Three, the idea of tacit knowledge interpreted through individual experiences and the human perception of reality is paramount. It is therefore argued that social reality in organisations is internal and thus follows the subjective or nominalist school of ontology.

4.1.2. Epistemology

The epistemological assumptions concern themselves with the nature and forms of knowledge, how it can be acquired and how it can be transmitted to others. The

questions arise as to whether knowledge is subjective or objective and relates back to beliefs about ontology. Philosophers who fall into the subjective category believe that knowledge can only truly be understood when it is internalised and 'experienced' as insight, whilst those who fall into the objective mould believe that knowledge is independent of human beings and can be acquired in a tangible form.

Knowledge is discussed in Chapter Three, and the concepts of tacit and explicit knowledge according to management theorists explained. It is the contention of this study and thus the justification for the qualitative research methods used, that tacit knowledge and thus internalised understanding is essential to discover 'truth' within a social context, based on the arguments put forward in Chapter Three.

4.1.3 Human Nature

Objective philosophy portrays humans as responding mechanically and predictably to the external environment, subjective philosophy portrays humans as actors and initiators who manipulate and respond unpredictably to the external environment, according to personal beliefs.

Chapter Three discusses perceptions of reality and how actors within organisations react to their environment. The organisational context is investigated and it is contended that these organisations are operating under conditions of turbulence and complexity and thus a subjective view of human nature is taken here. (See Chapter Three, Section 3.4 for discussions relating to organisations and complexity.) It is therefore argued below that an ethogenic approach was appropriate to the study.

4.1.4 The Ethogenic Approach

When considering studies of systems within and without organisations we must also consider the human element in these systems. Human beings are not only part of every system within an organisation they also make up the sole components of many systems that operate within the organisation. In studying organisations and their systems therefore, one must study the way that humans perceive and react to these systems.

Each human perceives the world around themselves from their own point of view; they view reality 'bounded' by their own experiences and knowledge. Thus humans act in social situations, in ways that are conditioned by their world viewpoint, they have views about what sort of behaviour is expected of them, what actions will result in their intended goals, and what rules they must obey in order to achieve these goals. Their speech, as well as their actions, are conditioned to produce the intended goals. To study systems with humans therefore one must study the behaviour and speech of humans as they act within these systems. This type of study is known as 'ethogenic'.

The ethogenic approach considers that each human is a plan-making, self-monitoring agent, aware of goals and deliberately setting out to achieve those goals, through the methods that they consider most likely to succeed. Harré (1978) describes explicitly the skills required in ethogenic studies and the assumptions that are made when such studies are carried out. Included amongst these assumptions are that the human tends to be the kind of person his language, his traditions, his tacit and explicit knowledge tell him he is. Ethogenic study also concerns itself with, in particular, the speech which accompanies any action, in that it assumes that the speech is intended to make the action intelligible and justifiable, the speech therefore is part of the 'accounting' of the episode. Speech is therefore extremely important in the ethogenic approach. Thus the use of interviews as part of data collection within the study of human systems is extremely valuable.

This study therefore followed a subjective or interpretivist approach to research methods, whilst using a trans-methodology paradigm as discussed below in Section 4.3.1.

4.2 The Interpretivist Approach

The subjective approach is also interpretivist - in that the researcher interprets the data based on their subjective biases, knowledge and understanding.

Each individual interprets data to give information based on their past knowledge of the phenomena which gives them an individual and unique understanding of that data. See the discussion above in Section 4.1.3 on Human Nature. This unique understanding is particularly valid when there is a lack of well-grounded theories in the field of study and many intangible characteristics surrounding the phenomena of study. Any exploratory

study will, by its very nature, contain intangible characteristics that can only be understood in the context of individual interpretation. Interpretive research gives a deeper:

> "understanding of the underlying process of organisational change (in the context of) an information system" (King 1996 p174),

and longitudinal, qualitative case studies reveal organisational processes.

4.2.1 Principles for Interpretive Research

In Table 4.2 the seven principles of the Interpretivist Approach as discussed by Klein and Myers are described.

Table 4.2 Interpretivist Approach (taken from Klein and Myers 1999 p72)

1. The fundamental principle of the Hermeneutic Circle	This principle suggests that all human understanding is achieved by iterating between considering the interdependent meaning of parts and the whole that they form. This principle of human understanding is fundamental to all the other principles.
2. The principle of contextualisation	Requires critical reflection of the social and historical background of the research setting, so that the intended audience can see how the current situation under investigation emerged.
3. The principle of interaction between the researchers and the subjects	Requires critical reflection on how the research material or data were socially constructed through the interactions of the researcher and participant.
4. The principle of abstraction and generalisation	Requires relating the idiographic details revealed by the data interpretation through the application of principles of one and two to theoretical, general concepts that describe the nature of human understanding and social action.
5. The principle of dialogical reasoning	Requires sensitivity to possible contradictions between the theoretical preconceptions guiding the research design and the actual findings with subsequent cycles of revision.
6. The principle of multiple interpretations	Requires sensitivity to possible differences in interpretations among the participants as are typically expressed in multiple narratives or stories of the same event under study.
7. The principle of suspicion	Requires sensitivity to possible biases and systematic distortions in the narratives collected from the participants.

These principles match and complement the methods of research undertaken in this study. As discussed above in Section 4.0.1 this study is holistic in overall view but is built from a trans-methodological paradigm thus a hermeneutic circle is undertaken. The object of the research study conducted as described was, therefore, through the hermeneutic circle, to make sense of the organisation as a whole and to identify the relationship between the various elements – the people, the organisation, the information systems, and the planning processes undertaken.

Through the case studies the study shows the contextualisation of the research. Below in Section 4.5.1 relating to how the data was analysed, the interaction between the researcher and the subjects is noted. The use of grounded data analysis permits of abstraction and generalisation and also demonstrates dialogical reasoning. The use of the ethnographic interviews, described through narratives, gives multiple interpretations and overall a principle of suspicion is maintained and demonstrated in the triangulation of the analysis as described below.

4.3 Triangulation

Triangulation is a multi-method approach to a problem of analysis. It is used to counter one of the criticisms (the implication of bias through the researcher's personal filter) that are levelled against research in the social studies, which any case study method must be considered a part of. As mentioned above it also provides the means by which the interpretivist principle of suspicion can be undertaken.

There are considered to be five components of research design:

The study's questions;

The study's propositions;

The study's unit of analysis;

The logic linking the data to the propositions;

The criteria for interpreting the findings.

Each proposition directs attention to something that should be examined within the scope of the study.

Linking data to propositions can be done by pattern matching - where several pieces of information from the study are matched to a specific proposition, taking into consideration the following questions:

How close do two patterns have to be to be considered as a match?

Can statistics be used here?

How many rival propositions are there for each set of data?

What if there is only one?

Triangulation is thus partially achieved through using different data sources to confirm the conclusions from the data collected – these can be documentary evidence, interview, survey techniques, or passive observation. According to Denzin (1970) there are six major types of triangulation that can be undertaken:

1. *Time* - using cross sectional studies and longitudinal studies;
2. *Space* - using multi-cultural studies;
3. *Combined* - using more than one type of analysis;
4. *Theoretical* - using alternative or competing theories;
5. *Investigator* - using more than one investigator;
6. *Methodological* - using the same method on more than one occasion or different methods on the same study.

Triangulation is particularly appropriate when a holistic viewpoint is sought and is required to offset investigator bias. The two case studies were longitudinal in nature and thus this research study triangulates across time (as Denzin argues above). In addition, this study utilised combined methodological triangulation to try and alleviate such potential bias. Combined analysis here would include quantitative data and as demonstrated in Chapter Six, an amount of such data analysis was performed to validate the grounded theory emerging. As argued below, it is reasonable to disconnect a method from a paradigm and thus one may use quantitative methods outside of a positivist paradigm. Use of methodological triangulation means using a multi (or trans as here) -

paradigm methodology and below we discuss the implications and issues with using such a methodology.

4.3.1 A Trans-paradigm Methodology

A paradigm is a general worldview based on assumptions from ontology, epistemology, and axiology, where axiology is the science of the ultimate reality and significance of values – a moral philosophy. It considers what is worth pursuing or promoting – what such questions mean and whether and how there is any way of arriving at answers to the questions that constitute knowledge.

We can describe a methodology as a structured set of guidelines or activities, within a paradigm, to assist in a research intervention. Each methodology uses a number of techniques, which are specific activities, with a particular purpose and often utilising tools - artefacts - to help perform a specific technique. Multi (and trans) - paradigmatic methodologies are considered desirable because:

Real-world situations are inevitable complex and multi-dimensional;

Research interventions are dynamic processes with differing phases that require different activities;

Adopting one paradigm means often only gaining one view (limited) of the research situation (Mingers 1997).

There are however, three problems associated with combining methodologies across paradigms – philosophical, cultural and psychological.

1. The philosophical problem. This is the issue of paradigm incommensurability. The fundamental assumptions of paradigms are different and therefore the rules under which research is performed are different. However Goles and Hirschheim (2000) would argue that there are no issues with moving sequentially from one paradigm to another and additionally that the exclusivity of the paradigm domains has been overstated (see also Gioia and Pitre 1990). Paradigms are permeable at the edges – there are transition zones. Bridges can thus be constructed across boundaries. Smaling (1994) also argues that that there is not one single set of paradigms and distinctions between them are questionable. Research methods may also not be completely internal to one paradigm (Mingers and Brocklesby 1996; Smaling 1994) and it is possible to disconnect a method from a paradigm and use it in another context e.g. the use of quantitative data outside of a positivist, objectivist epistemology. Thus one can use such data and interpret in the light of relevant social meanings. It is argued above that an interpretivist approach is taken but that triangulation requires using multiple methodologies on the same data. Giddens' Structuration theory (1984) would also show that it is not feasible to separate out objective and subjective dimensions. It is argued therefore that different paradigms give us multiple viewpoints and perspectives to deal with complex realities which single paradigms cannot capture (Mingers and Brocklesby 1996; Smaling 1994).

2. The cultural problem – this is the extent to which organisational and academic cultures militate against multi or trans-paradigm work. There is evidence that in the US a more positivist subculture exists in relation to research paradigms (Mingers 1997) and that individual's methodological preferences are often reinforced by institutional, physical, and geographic boundaries of their communities. These preferences are often tacit and relate to Communities of Practice. The well publicised problems and issues with information systems (especially the failures of large Governmental systems - Morris and Travis 2001) may have the effect of changing dominant paradigms and increase the likelihood of trans-paradigmatic work.

3. The psychological problem. There is a problem for individuals moving from one paradigm to another (Mingers and Brocklesby 1996) as personality traits affect research preferences for paradigm choice – there is therefore a question whether cognitive predilections can be altered. Individuals may not be able to transform their personality preferences in order to change paradigmatic choice or to perform trans-paradigmatic research. Training tends to reinforce personal habits also.

Mingers (1997) produces a framework to map research methodologies and the various research methods and approaches against the phases and dimensions of an intervention. Below the two phases of this framework have been combined against the research methods and approaches used and the use of trans-methodologies is demonstrated whilst acknowledging the issues surrounding trans-methodological research.

Table 4. 3 A Map of Research Methodologies as utilised against Mingers' Phases and Interventions.

Characteristic	**Requires:**			
	Appreciation of	*Analysis of*	*Assessment of*	*Action to*
Social	Social practices, and power relations	Distortions, conflicts, and interests	Ways of altering existing structures	Generate empowerment and enlightenment
Through use of:	*Case study *Ethnographic interviews *Literature review	*Influence diagrams *Interviews *Language/Action *Literature Approach	*Dialectical *Hermeneutics *Language/Action *Social Statistics *Strategic Choice	
Personal	Individual beliefs, meanings, emotions	Differing perceptions and personal rationality	Alternative conceptualisations and constructions	Generate accommodation and consensus
Through use of:	*Interviews	*Case study *Interview	*Case study	

It can be argued therefore that elements from a variety of methodologies across the Personal World axis have been combined by using case study analysis and interviews alongside analysis of language/action, literature and influence through diagrams. The analysis has provided insight into distortions, conflicts and interests and the tools and techniques offered as part of the framework proposed in Chapter Six show ways of

altering existing structures as well as generating empowerment and enlightenment for organisational stakeholders of the SPIS process. These tools and techniques will also generate accommodation and consensus with alternative conceptualisations and constructions during the SPIS process. Grounded data analysis provides the necessary theory and propositional development from data roots.

4. 4 Case Study Methodology

This study uses the case study methodology. Case study methodology is appropriate for studying organisations undergoing change and permits of a holistic view of the dynamic processes. It permits analysis of retrospective change as well as real-time analysis. Within the case study methodology as propounded by Pettigrew, Ferlie and McKee (1994) the historical antecedents and chronology of change are all considered vital.

Case studies are by their very nature pluralistic and versatile (Cavaye 1996). By their nature of being grounded in the data, case studies do not explicitly control or manipulate the variables. They study the phenomena in their natural context at one or (in the case of this project) two of a few sites. This is particularly appropriate where few previous studies have been carried out. Sites for case study research must therefore be selected carefully as being typical or representative of the phenomena under consideration.

Case studies are also well suited for areas where research and theory are at formative stages or where existing concepts can be developed and refined. Cavaye (ibid) discusses the validity of case study research where there are a large number of variables and a number of different aspects of the phenomena that previously may never have been determined and Yin also argues their appropriateness where the boundaries between phenomenon and context are not clearly evident (1981). The case study method relies on the assumption that the case (or cases) being studied are typical of a certain type, this would mean that intensive analysis of the cases may allow generalisations (Kumar 1999) that will be applicable to other cases of the same (or similar) type.

Cases need to be selected from the accessible population of cases (Cooper 1984) and the time available for study, financial resources and other practical considerations need to be taken into account. When studying large and complex issues it behoves the researcher to

study large and complex organisations that can adequately reflect the issues under study and provide the researcher with in-depth data. These cases need to represent the variables under study i.e. in the case of this research project they needed to be undertaking the process of SPIS.

The question arises as to how many cases to study. In theory there is no upper or lower limit – one case may be sufficient (Mintzberg 1979) – however it is the research problem and the research objectives that influence the number and choice (Ghauri, Grønhaug & Kristianslund 1995). Qualitative data looks for detailed data about a limited number of experiences (Patton 1990). Richness of detail is of greater importance therefore than the number of cases. The aim is to provide typical cases as well as those that might provide greatest understanding. Yin (1981) additionally argues that the choice must be made from cases that are worthy of substantive attention and where there are sufficient to permit cross-case patterns to emerge (he would take issue with Mintzberg here). He says that cross-case analysis requires that the lessons learnt from each case study will provide common explanations and that these explanations may be derived from the first case and then applied to the second. Anomalies must be accepted and thus modifications in the explanation may be required. Thus two cases are sufficient for Yin. The requirements of longitudinal and holistic depth (as discussed above) combined with practical resource constraints (the researcher was working full-time whilst undertaking the research study in her 'spare' time) meant that the number of case studies able to be undertaken was limited. In addition, whilst it was considered that one case study would not generate theory development that could be considered generalisable, two case studies of organisations that were similar (in size, overall orientation, industry sector, basic structure and form, as well as physical location) were considered sufficient to permit of theory development. Whilst acknowledging that differences were to be expected due to individual organisational cultures, it was expected that the theory formulated would be generalisable to similar organisational types. It was also expected that such theory could be extrapolated to fit other organisational structures and industry sectors (see arguments below).

Patton (1990) provides sixteen examples of ways to select cases, of these three were unsuitable for this research (typical case sampling, stratified case sampling and critical case sampling) as they could not provide for generalisation of the results which was necessary for theory formulation. Additionally nine further strategies were not suitable as they either required a large number of cases to be studied (which was impractical as the organisations needed to be studied in depth over time in order to monitor a strategic planning process) or required there to be political intervention or known examples of expertise in the area (which was not possible as this is an area where theory is still under development). This left four potential strategies for case selection – extreme cases; intensity sampling; maximum variation sampling; and homogenous samples. Homogenous sampling is intended for use with small subgroups, using focus groups as a prime data collection method, and thus was not suitable for a holistic study of an organisation. Maximum variation sampling requires a large sample in order that common patterns may emerge and thus was not practical as argued above. The two final strategies for case selection were achieved. At the start of the research project it was believed that both cases selected would fall into the intensity sampling strategy where cases manifest the phenomenon of interest but are neither extreme nor unusual, and contain sufficient intensity to illustrate attributes of success or failure in the process under study. The case of UofA fell into this category of research. In retrospect, after analysis, it can be concluded that the case of UofB fell into the first strategy of an extreme case – which was unusual due to extreme failure in the process under study. However, this was not known at the time of selection. Extreme cases are enlightening Patton (ibid) says, because lessons can be best learnt from these to assist in more 'normal' situations. Two cases were considered sufficient to discover sufficient depth whilst also permitting of generalisation from the findings for theory formulation. It was necessary to acquire access to two organisations of similar size and industry sector that were undertaking the process under study for theory formulation to be feasible and thus for an academic undertaking a research project (as in this instance), universities were a suitable and practical option as they were likely to be sympathetic to the process of study.

A weakness that has been identified with case study research is the difficulty in extrapolation of the findings into other organisations or situations. This study alleviates the issue of extrapolation difficulties by using two similar (by industry sector, historical background, and size) but different by culture, management style and financial status, organisations. Thus demonstrating that the consistency of findings between these two organisations also demonstrates the validity of these findings. The use of existing theory from Doll and Torkzadeh (1987); Earl (1993); and McKeen and Guimaraes (1985), (see Chapter One for further details of these), to demonstrate these findings, also validates the extrapolation and generalisability of these results.

Case studies must make use of qualitative tools and techniques for data collection and analysis as described below.

A variety of archival material as well as collection of internal documents such as newsletters and minutes of meetings, enhance case study richness. Externally available documents in the public domain supply evidence for change within the environment and supply also the context within which this organisational change takes place (in this study regular scanning of the weekly 'industry' newspaper is evidenced not only in Appendix Three relating to the HE environment but also is used in the organisational stories to evidence the effect external events were having on internal). Case studies also involve routine site visits and interviews with selected stakeholders in the change process. It is important that such stakeholders be selected from a wide range of functional groups and hierarchical levels in order that the study boundary might be established.

The case study methodology is compatible with the use of chaos theory to supply us with understanding of the phenomena that we see. Chaos theory can provide us with understanding that is holistic, historical and qualitative. Kellert (1993) says that by constructing, elaborating and applying simple dynamical models of chaotic systems we are involved in a holistic, experimental and diachronic study. We do not reduce the system to its component parts, we do not present the results in the form of deductive proofs, nor do we treat the systems as if instantaneous descriptions are complete. Chaos theory and complexity in relation to organisations is discussed in Chapter Three.

Diachronic study is particularly appropriate for systems exhibiting 'hysteresis' effects. That is, the study of a subject through its historical development is appropriate where systems' cause and effect are not simultaneous - the effects lag behind the cause, and we can trace the earlier treatment of the system to its current behaviour. We therefore need to record its previous behaviour and the history of events that have or could have affected it, in order that we might understand how and why the system behaves as it does in current time. This would relate to the ontic[1] explanatory view where progress in understanding is seen as a result of the disclosure of the hidden causal processes, which are responsible for apparently mysterious behaviour.

There are several methods of analysing and reporting accounts and episodes. (Details of an account gathering methodology is given in Appendix Two.) Accounts should be seen within the context of social episodes, part of social life, they will have a recognisable beginning and ending and the actions contained within them will have a meaning for the participants. Ethogenic research is concerned with the perceived behaviour and also the intentions, beliefs and feelings of these participants. This study has chosen to report the account through the organisational story as described below in Section 4.4.2. One of the major problems with accounts after eliciting and analysing is authenticating and this can often be obtain by using triangulation as discussed above in Section 4.3.

4.4.1 Case Study Typology

The case study method is typically used in Social Science research. It was particularly appropriate for this research study as this study used organisations within their environmental setting as an exemplar. Case studies typically fall into one of three types:

Exploratory;

Descriptive; or

Explanatory.

The type of research questions that are being asked typifies each type of case study. An exploratory case study typically focuses on "what" questions; a descriptive case study will

[1] A term used in scientific philosophical discussions as the opposite to epistemic which is the a priori nature of knowing. In an ontic state there is no distinction between an observed and observing part of a system.

focus on "what", "who" and "where" questions; and the explanatory case study will focus on "how" and "why" questions. This study was looking to explain certain phenomena and to improve understanding as to how and why these phenomena happen. Thus the case study type utilised was of the explanatory kind. The explanatory case study is of relevance in examining contemporary events where the behaviours are not intended for manipulation. It utilises observance and necessary interviewing, as well as documents and artefacts.

As Yin (1994) says a case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are clearly evident. Contextual conditions are particularly relevant to the phenomenon of study here and as such the case study inquiry will cope within a technically distinctive situation in which there are many more variables of interest than data points; it will rely on multiple sources of evidence with data needing to converge in a triangulating fashion; and will benefit from prior development of theoretical propositions to guide data collection and analysis. These theoretical propositions are put forward in Chapter One.

It is necessary to recount the case study observation and findings in an appropriate form. This study has chosen to do this through the form of organisational story telling as described below.

4.4.2 Organisational Story-telling

Story telling is an ancient medium for communication and meaning making. Boyce (1996) says that the story-telling process is a primary vehicle in the organisational context for expressing both individual and collective meaning. As such, according to Fisher (1987), the narrative is a paradigm, which presents a philosophy of reason, value and action, which provides meaning for the recipient. Organisational members can use the story in problem solving within the organisation, and as action research.

4.4.2.1 Characteristics of a Good Story

Morgan and Dennehy (1997) claim that there are four key components of good organisational storytelling as abstracted from the work of Wilkins (1984) and Zemke (1990). These four components are:

The stories must be concrete. They must tell about real people and describe real events and actions. They must be set in a recognisable time and place and must be connected to the organisation's philosophy or culture.

The stories must be common knowledge. The story recipients and the actors within the story must know them so that its moral can be followed.

The stories must be believable and must be true of the organisation.

The story must describe a social contract – how things are done or not done in the organisation. Organisational norms, rewards and punishments are described without the recipient actually having to experience them.

In using organisational story telling as a researcher external to the organisation, and to tell these stories to other externals, means that to some extent we are negating some of the 'good story' characteristics. In particular, we cannot claim these stories will be common knowledge to the recipients and it is unlikely that the stories' actors will ever read the stories in which they feature. However, it is possible to tell the stories in such a way that the moral of the story is clear for the recipient if all the other three good characteristics are put in place. An interesting challenge in this context is that Martin, Feldman, Hutch and Sitkin (1983) claim that a 'good story' should be unique and should demonstrate that the organisation is different from any other. However, from the perspective used here it is necessary to demonstrate that although the story is unique to the organisations concerned and can never be repeated exactly, yet there are common elements in the stories that will also be found in other stories about other organisations undergoing similar processes. Thus this study will demonstrate in Chapter Five through comparison with the Doll and Torkzadeh (1987) and the McKeen and Guimaraes (1985) hypotheses (see Chapter One); and in Chapter Six by analysis of the organisations' weaknesses using theory generated by Earl (1993; 1996), (see Chapter One again for further detail on these), the similarities in the stories about two organisations (and thus the potential for

generalisability and theory development) whilst acknowledging their uniqueness and differences.

4.4.2.2 Components of a Good Story

Organisational stories reflect an event happening and describe this event from 'climax to resolution' (Boje 1991). In order to complete this, the story needs to pass through five stages. Davis (1993) calls these five stages:

Setting;

Build-up;

Crisis or climax;

Learning;

And new behaviour or awareness.

Setting describes the time, place, players and the context within which the story is placed.

Build-up describes the sequence of events that leads to an issue being raised – or "trouble's coming" (Davis 1993). The actions of the story's actors are described that lead to the crisis that follows.

Crisis – this is the climax or high spot of the story. In this part of the story the key event is described. This key event may be unexpected and may not be obvious from the events that have led up to this point so far. It is the crisis point that leads to the actors within the story to learn something new.

Learning takes place as a result of the crisis. The actors within the story learn something new from the events that unfold within the story. The recipient of the story learns the moral of the story.

New behaviour results from maintaining and embedding the learning in future behaviour. This is also sometimes called 'how the world changed'. Unfortunately, in organisations it is not always the case that the lessons learnt are for the benefit of the either the individual or the organisation, but hopefully, external recipients of the storytelling process can see

the morals without prejudice, and can develop new behaviours in their organisations as a result of the lessons they learn from other organisations.

The data from which organisational stories are built come from (as discussed in Section 4.4 above), archival material and other document-based material as well as interview material. Below we discuss methods for analysing textual (and archival) material through grounded data analysis to permit of deductive proposition forming. In Section 4.6 and 4.7 we discuss how an interview corpora for the case build-up was constructed and how the interviews were reported.

4.5 Grounded Theory

Grounded theory is one of five qualitative research approaches. In qualitative research there are three main components – data and data collection; the analytic or interpretative procedures, which conceptualise and code the data; and the written and verbal reports.

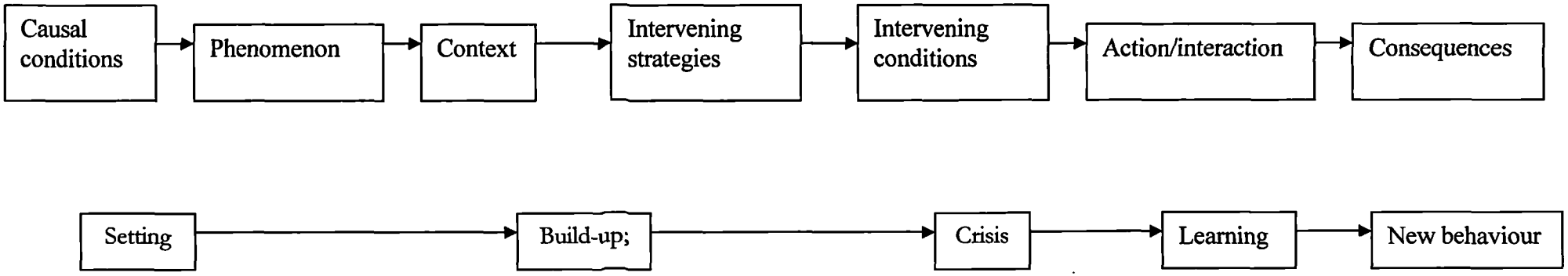
As described above in Section 4.4 a case study method is utilised, through organisational story telling to report on the results of the research. The data on which these organisational stories are based was derived through systematic collection and analysis of the phenomenon under study – namely the development of Central Administrative Computer program suites and the relevant planning processes in two UK universities.

When using grounded theory a series of processes are carried out – firstly open coding; secondly axial coding and lastly selective coding (Strauss and Corbin 1990).

Open coding is the process of analysing data by breaking the data into categories, examining it and conceptualising. The attributes or characteristics pertaining to a category are identified. Each sentence or paragraph in a textual artefact is taken apart and each discrete incident, event or idea is given a name (a code). These names are compared to ensure that each time an item is labelled, it is labelled with the same name, for the same reason. In the example of this study, this process of open coding was performed with the help of a database program specifically designed for this task (a Document Indexer). Further details of how this process of open coding was carried out is included in Chapter Six.

Axial coding is the procedure whereby after open coding has been completed, the data under consideration are put back together again in new ways and categories. Connections between categories are made. When using the Document Indexer it was possible to do this by creating Term Trees, where terms (or data codes) could be connected to other terms across documents and connections explored. Axial coding also requires the researcher to investigate the phenomena under consideration and look at the specific set of properties that pertain to those phenomena. The stories that are told relating to these phenomena thus contain the locations of the events within which the actions are undertaken, the structural conditions that bear on these actions and that may facilitate or constrain these actions, and the strategies that are devised to handle, carry out or respond to the phenomena under investigation. The stories end with the consequences of the actions. In Section 4.4.1.2 above we have described storytelling as having five stages through which it must pass. Under axial coding we can see seven stages of analysis. Below Figure 4.1 maps the five storytelling stages against the corresponding seven axial coding stages.

Figure 4.1 The Seven Axial Coding Stages and Organisational Storytelling



Finally in developing grounded theory selective coding is performed. This stage develops the story line through the paradigm – the conditions, context, strategies and consequences. Again we see how the organisational storytelling process maps onto this stage of grounded theory. Within the story, process and contingency are evaluated whereby there is a linking of action and interactional sequences and additionally, an investigation of the unanticipated happening that brought about a change in conditions. This change may have a number of properties in terms of the speed of change, the shape and direction, the scope and impact and the organisational ability to control. All these are explored in the storyline.

Grounded theory also looks at a matrix (a set of circles) that focuses influences from the external environment down to the lowest level of organisational action. In order to ensure that irrelevant influences are not followed it is necessary to verify the effect and to follow an event through its repercussions on the organisational story. Discriminate sampling is necessary in order to maximise the opportunities for verifying the storyline. In the two stories told in Chapter Five sampling is performed through the Corpus Construction of interviews in the story of UofB and through the sampling of relevant documents to verify; and in the case of UofA a wider sample of documents is sampled plus a verification interview with a key actor in the story.

4.5.1 How the Data was Analysed.

The research process according to Strauss and Corbin (1990) consists of seven stages:

1. Selecting the original sample – and identifying the grounds for selection (conceptualisation, gaining access, sampling, designing research tools);
2. Identifying the major categories that emerge (collecting data and coding);
3. Identifying the events, incidents, actions that pointed to the major categories;
4. Identifying on what categories theoretical sampling proceeded. Identifying how representative the original categories were (analysing data);
5. Formulating hypotheses and testing;
6. Identifying the veracity of the hypotheses against actual results. Changing the hypotheses if required;

7. Identifying the core category and the grounds for its selection.

Finally the results are written up - the implied Stage Eight.

Below is shown these stages against the two organisations studied and how the research conformed to the research principles advocated by Strauss and Corbin (ibid). Chapter Six expands this detail.

It is necessary that as far as practical the research should be undertaken in an objective, unbiased and value-free manner and in the research carried out here the use of the Document Indexer to build categories proved essential. Chapter Six discusses further the issues surrounding the use of commercially programmed document analysis offerings and the reasons for choosing to develop a unique program for this study. In essence the issue was related to maintaining the value-free and unbiased objectivity required for 'good' hypothesis or proposition formulation.

It is important to note that both organisations conformed to the same organisational type (i.e. they were both universities) and that the researcher also works in a university and thus the researcher had some preconceptions of how universities operated and performed their tasks. However, the researcher had never participated in the SPIS process in any organisation and had only theoretical knowledge of how this might be performed within any organisation. Whilst the researcher had worked at UofB some years previous to the study undertaken, for a small number of years, she had never worked at UofA. The spell of employment at UofB assisted in obtaining the data and gaining permission for the study and additionally, gained (better) acceptance for undertaking the interview process. At no time did either organisation offer any monetary compensation for the expenses involved in conducting the research.

4.5.1.1 The Case of UofA

Stage 1.

The data to commence this study was donated by a member of the committee under study who had been tracking the committee's activities from commencement. Formal permission from the organisation concerned to use the material and track further activity and publish was applied for and received.

Initially the data was sorted in order of type of document e.g. minutes, agendas etc and each document coded accordingly with a document code and date of creation. A document file containing all this data and coding explanations was created. The documents were then re-sorted into date order. Each year was separated out and each month's documents collected together. The documents were initially scanned for a 'story' and the history of the development of particular administrative systems and group ideas was traced - e.g. the story of the student record system was created through the years, noting the documents in which it was mentioned and the crucial dates relating to events in its history. Documents, which did not directly relate to internal activities (such as reports from external agencies) were put to one side.

A spreadsheet was created from the documents detailing all the activities undertaken by the Information Systems Strategy Group (ISSG), the date they were initiated and where possible who by. It also traced the dates of next mentions, people allocated actions on it and estimated time for completion - repeated as often as required. This presentation of the data enabled the progress and outcomes of individual projects and activities to be traced over the time period of the study and compared with the ISSG's documented intent.

In addition, a list of committee members was created and tracked through the life of the ISSG. This was compiled with a list of attendees who were not official members but nevertheless had activities related to the actions of the committee e.g. by joining in on working parties etc. This enabled Stakeholder Webs to be drawn. (See Chapter Six for a full discussion of Stakeholder Webs and below in Stage 5/6.)

Stage 2 and 3.

Major categories emerged in terms of projects under work and unfinished. Also it became apparent that a number of projects were inter-linked at some or most of the stages of their development. The documents and spreadsheets developed indicated these linkages and category development. The Document Indexer used to analyse the data also permitted categories to be developed and manipulated and additionally reported on. (See Chapter Six for further details.)

Stage 4

Whilst the data analysis was being performed, further data was still being collected. Initial sampling indicated that the prime source for data collection would be from the records of the relevant UofA committees and so these records were followed and obtained on a regular basis to add to the data already collected.

In addition, occasional forays into the UofA web site were performed to verify details. The categories developed were refined through use of the Document Indexer and term trees were created and adjusted as categories proved more or less viable or linkages were discovered.

Stage 5 and 6

Seven propositions (or arguments) were formulated. In addition, five theoretical arguments relating to weaknesses (Earl 1993) were identified and matched against the data discovered. These arguments were refined and tested against the data in a paper published in 2001 (Coakes and Elliman). The weaknesses were matched against the data for this paper but also for analysis to be presented in Chapter Six.

The framework discussed in depth in Chapter Six was initially developed to alleviate the arguments and weaknesses discovered and verified by the data analysis. This framework (Coakes and Elliman 2001) consists of seven stages of activity performance. Part of this framework consisted of Stakeholder Webs.

Stakeholder Webs were originally created (by E Coakes) for work described in Coakes and Coakes 1994. They were developed further in 1997 when a conference paper was presented on initial thoughts relating to the UofB case study (Coakes and Elliman). Here external and internal Stakeholder Webs were drawn. Stakeholders were grouped according to perceived relationships and shaded areas linking these stakeholders were created. Examples of webs as used to illustrate the stakeholders in the organisations under study are indicated in Chapter Five as the stories unfold. The researcher chose to group stakeholders according to the documentary and interview evidence of connections and links to activities. The immediateness to the use of the central administrative systems and the direct (as opposed to indirect) impact that these systems had on a daily working life, is indicated by the concentric circles within the web. The closer the circle to the central systems, the greater the daily impact, thus the daily users of the systems are in the centre (or close to) of the web. In late 1998 / early 1999 these Stakeholder Webs were further developed for the purpose of a paper on the UofA case study (Coakes and Elliman 1999).

Data analysis showed that in the case of UofA not all weaknesses were apparent in their totality and the seven arguments were refined into five for the purposes of the paper in 1999. However, here the full seven arguments are considered and their validity for the case of UofA and the proposed framework is shown.

The length of time over which the studies were conducted and the length of the time period over which documentation was amassed, permitted the researcher to learn increasingly more depth about the case organisations. Additionally, it permitted periods of introspection and reflection on the material that generated theory proposition and learning and thus understanding of the process involved in SPIS. This theory generation produced the framework as described in Chapter Six. As discussed above, and illustrated in Chapter Five, a process of learning was also being demonstrated in the organisations under study as new behaviour resulted and became embedded in their activities. See also the previous discussion in Section 4.4 relating to the *ontic* view where progress in understanding is part of the diachronic study.

Stage 7

This stage cannot be said to follow stepwise from the previous stages. It is a justification of how the activity of analysis and research was performed. It is in fact a check on the research activity for its validity.

In the case of UofA the collection of the core category(ies) were gradual and emergent. The term tree development permitted these categories to appear and through the reports that were run after and during the data collection, patterns emerged. It was decided that although these patterns had emerged for the case of UofA, when the Document Indexer was utilised to analyse the data for UofB no term-tree would be copied. The Indexer would be used in 'virgin' form and the terms would be permitted to emerge. In Chapter Six is shown the differences and similarities in terms between the two cases and comments on the reasons why this might have happened are offered.

4.5.1.2 The Case of UofB

Stage 1

Permission to commence the study was obtained by discussion with the senior management and by agreement when interviews were conducted. All participants were informed of the reason for the interview and the anticipated result (i.e. *Ph.D.* thesis and other publications). Copies of early publications were sent to the senior management involved in the interviews.

Data collection for the case of UofB proceeded in a different manner from that of UofA. UofB data was primarily collected through interview recordings with some archival material acquired throughout the study period. UofB textual data was primarily historical archival material with regular report (text) updates. The archival data was collected by a member of the organisation for the purpose of this study or was given by interviewees as backup to their statements. In addition some publicly available material was collected. Access to a web discussion group was obtained and this was monitored for relevant material.

The interviewees were selected according to a corpus construction discussed below in Section 4.6. All interviewees could choose whether or not to be interviewed and a small number refused due to time pressure. However, the corpus construction was completed as those interviewed were able to suggest alternative interviewees who fulfilled the same or similar role.

Stage 2

The documents were sorted for relevance based on the propositions that emerged from the case of UofA, and then input to the Document Indexer. A similar spreadsheet for tracking documents was also created as documents were collected.

The documents were analysed without reference to the term trees collated for the case of UofA but as they were analysed subsequently, they naturally were subject to a less objective view of terms. However, as is pointed out in Chapter Six a number of differences did emerge in both the terms and the usage of these terms and also the term trees compiled.

Stage 3

The interviews were typed into transcripts and the transcripts were then turned into narratives. Section 4.7.1 below discusses the use of narratives in framing stories from organisational investigations.

As in the case of UofA the Document Indexer was also used to refine categories.

Stage 4 and 5

The interviews took place over the period of two years but analysis did not start until almost all interviews had been completed. A few final interviews were suggested and completed during the analysis phase by members of UofB who were interested in the study.

The archival data proved to be less rich than that of UofA and this was enquired into with the UofB contacts. It was assured that the data received was full and complete and that it was truly less rich in the area under investigation. This led to some thoughts about the propositions that allowed them to be further developed and refined.

Stage 6

Stakeholder Webs and the Interaction Matrix were used in UofB as part of the data collection method. During the period they were used they were refined and the results used as part of the basis on which the framework was then developed (see above under Stage 6 for UofA). An early paper showing the origins of the Interaction Matrix was published in 1997 (Coakes and Elliman). This matrix is discussed further in Chapter Six.

Stage 7

This is commented on above in the case of UofA and follows the same process, as by the time this stage had been reached, both sets of data were being considered together for proposition/argument discovery and construction.

Below is discussed the method by which the interview evidence was collected for the case of UofB as mentioned above under Stage 1.

4.6 Corpus Construction

Empirical social research requires evidence and must justify the selection of that evidence through, it is suggested by Bauer and Aarts (2000), a corpus construction.

Corpus construction means a systematic selection to some rationale, which includes a representative sampling of qualitative data. It is used as an alternative to random sampling, which has a long history of use in the Social Sciences. Sampling secures efficiency as it provides a rationale for studying only parts of the population under consideration. The larger the sample the less the potential error margin. Each member of the sample is chosen according to preset criteria which therefore limits the sample population that can be chosen. The construction of the preset criteria or sampling frame

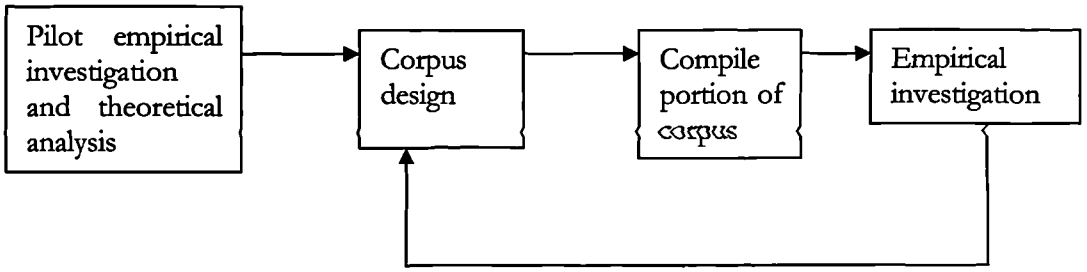
provides the first bias in random sampling. A second bias will occur when not all members of the selected random sample are available for study. A corpus or 'body' is:

> A finite collection of materials, which is determined in advance by the analyst, with (inevitable) arbitrariness, and on which he is going to work. (Barthes 1967, p96)

Arbitrariness is inevitable according to Barthes, as selection ensures that comprehensive analysis has priority over scrutiny of selection.

Whilst corpus construction originated with Linguists in Bauer and Aarts (2000) view, it can be extended into the qualitative research field. A model of corpus design as a cyclical process is shown below:

Figure 4.2 Corpus Design as a Cyclical Process (Biber 1993 p256) in Bauer and Aarts p29



Archival collections are eminently suitable for corpora construction and in case study analysis the collection of archive texts would fall into this category. In this study large numbers of texts (271 separate documents in the case of UofB and 372 in the case of UofA) are considered in the archive analysis. In addition, the principles of corpus construction can be applied to interview sampling of a population and this is shown in the construction of the interview sample at UofB.

Selection requires relevance, homogeneity and synchronicity. That is the materials collected must be relevant to the study underway. In the case of UofB a number of texts were collected from a variety of viewpoints but the main part of the analysis was performed on 'official' texts i.e. texts that were produced by the university centrally for open distribution. In addition, documents that were not relevant to the study underway were not considered for textual analysis. This narrowed down the archival material to 17 texts in comparison to UofA where more texts fulfilled the study criteria (152 texts) for analysis. Homogeneity requires that such selection does not mix format or media, thus texts should not be mixed with visual records. It was thus important that the interviews (which were taped and transcribed) should not be analysed in the same manner as the archival texts and should not be included in this textual analysis. Thus a series of 'narratives' were constructed from the interview transcriptions. Finally synchronicity requires a stable and similar time frame for study. The two case studies and archival material span the years from 1993-2000 for UofA and 1994 – 2000 for UofB and thus are synchronous.

Interview selection under corpus construction is performed through criteria matching, such as functions and categories. In the case of UofB it was important to select interviewees from the body of relevant stakeholders (see Chapter Two for the definition of stakeholders developed for this study). This selection of interviewees was thus constructed through a process of 'snowball' interviews. An initial interview was carried out and a request was made as to 'whom else to interview' who was relevant to the study in progress. This 'snowball' was also used to create Stakeholder Webs – one of the suggested tools (see Chapter Six) that is part of the framework proposed. In total 18 interviews were conducted. Initial interviews were conducted (two interviews also contained two interviewees) and a further two interviews were conducted towards the end of data analysis in a more semi-structured way to confirm and enlighten the analysis process.

The aim in interview list construction is to achieve saturation through consideration of the appropriate strata of functions and categories, when no further new strata representatives are suggested then saturation has been reached. Sometimes, a particular strata or representative of that strata, is mentioned more frequently than others, in which case it is appropriate to interview more representatives from that strata or to interview representatives more than once. In the case of UofB more representatives of the Registry were interviewed as it was identified that the Registry function was central to the study being undertaken, and, for example, the Data Team Manager was interviewed more than once as she was considered to hold the central role in the Registry related to the systems under study.

Corpus construction must have limitations due to time for analysis and data collection. As shown above, archival text collection easily attracts more texts than are relevant to the study being undertaken and can continue ad infinitum. Data dungeons are easily constructed and a small one has been, by the researcher, for material collected during this study!

Having constructed a method for sampling it is also necessary to consider a method for undertaking the research work. In the case of UofB it was decided that the interviews would be conducted ethnographically and the reasoning for this choice is explained below.

4.7 The Ethnographic Interview

This study was not undertaken as an ethnographic piece of research but elements of ethnographic study were included in the way the interviews were conducted. (See Section 4.3.1 above on the use of multiple methodologies in research.)

Ethnography is considered to be the work of describing a culture, the essential component being to understand the way of the life from the 'native' point of view (Spradley 1984). In ethnographic fieldwork cultural inferences are realised from what people say, how they act and what artefacts they utilise. The ethnographer enters with few pre-conceptions as a professional stranger. The work is stakeholder led and differing views are accepted. The organisational culture (both tacit and explicit) is revealed through

their speech - both informal conversations and through interviews and is coded in linguistic form and body language, rituals etc. (See Chapter Two for discussion on language and meaning relating to word meanings.) In the case of this study, as the researcher was a member of an alternate university, she fulfilled the requirement of being a professional stranger. In addition, the corpus construction of the interviews at UofB were stakeholder led (through the snowball technique discussed above). The researcher's initial ignorance of the SPIS process from practical experience meant that there were few pre-conceptions and differing views were accepted and reported in the organisational story telling form of reportage.

Spradley (1984) warns the ethnographic researcher of the tendency to translate according to 'own' culture and thus ethnographic interview techniques are specifically designed to try and overcome this tendency. Ordinary people with ordinary knowledge are sort for and their common experience helps shape the propositional development. Thus there are five minimal requirements for identifying a good informant:

1. Thorough enculturation;
2. Current involvement;
3. An unfamiliar scene for the ethnographer (as the researcher was not a (current) member of either organisation under consideration, this lack of enculturation was evident);
4. Adequate time (for the interview);
5. A non-analytic informant.

The interviews were performed in a 'focused' manner where a sample list of topics was compiled (for reference purposes only) but no set questions apart from 2 were asked. The two set questions for each interview were:

'What do you understand by the term stakeholder and who do you think are stakeholders (of the system under discussion)?'

and

'Who else should I interview?'

These questions enabled the corpora to be constructed. Probing was undertaken when interviewees either needed prompting to continue with their story or said something that needed further explanation for the interviewer's understanding. Wherever possible interviews were recorded. The interviews were conducted in an informal manner (in a garden in one instance, in a café in another) with typical greetings and explanations of the purpose of the interview. Indeed, such was the interest in being interviewed that it was discovered that interviewees were reporting back to each other on their experiences and a comment was made that 'it was like a psychotherapy session' – interviewees could use the sessions to talk about what was bothering them in relation to the CISs under discussion and the general planning systems undertaken by the university. It was endeavoured to allow the interviewee to speak the most part of the conversation, only prompting and questioning for elucidation. The interview transcripts are complete with all the normal pauses and hesitations as well as incorrect grammar and speech 'shorthand'. Quotations from interviews are reported in the narratives and organisational stories complete with all these normal speech artefacts.

As well as the interview transcripts typed from the tapes, two other texts were created at the time and after the interview. One was a note of the major points raised by the interviewee and thus was a written semi-complete interview transcript. The second text was a subjective view of the interviewee and their demeanour during the interview. Noting for instance whether or not they were nervous, hesitant, confident, outgoing etc. This was very much an emotional reaction to the interview and what was said and how it compared with other interviews, and thus assisted in the enculturation of the interviewer.

The interviews all lasted between 40 and 70 minutes. They were not completed until either the interviewee felt that they had nothing more to say or they needed to go off to another appointment. Viewing the interviews retrospectively, it would seem that adequate time was allocated as in no instance was there the need to return for further information to clarify what had been said. A second interview was conducted only as a means of story verification and only after significant time lapse.

The interviews were written up in the form of narratives and below this process is described.

4.7.1 Narratives and their Analysis

Whilst the interviews for UofB were not explicitly conducted as 'narrative interviews', the transcripts, combined with the researcher's notes were written up into narratives. Additionally, the researcher encouraged the interviewees to 'tell their story' and thus elements of narrative interviews were incorporated into the process. Narrative interviews are particularly useful in three instances (Schütze 1977, 1992). These are:

The investigation of specific events especially 'hot' issues – which in UofB was certainly the case for the development of the Student Record System (SRS) and the organisational happenings that impacted on it;

Projects where there are many different voices – different stakeholders – again this fitted with the situation at UofB;

Projects that combine life histories with socio-historical contexts. Personal experiences in a certain situation would typify this type of event. As the interviews sought to elucidate personal experiences of the organisational events in UofB, again the circumstances would warrant narrative interviews.

Schütze (1977, 1983) considered that there were six steps to analysing narrative interviews:

1. A detailed and high quality transcription of the verbal material. In the case of UofB this transcription, from interview tapes, was performed by professional tape transcribers;

2. Separating the text into indexical and non-indexical material. Indexical statements refer to who did what, when and why. Non-indexical statements express values and judgements;

3. The indexical components are then used to construct an ordering of events for each individual. In addition, here the indexical components are used to construct the organisational story in Chapter Five;

4. The non-indexical components are used to construct operative theories (propositions) to compare with the narrative as a process of 'self-understanding' from the interviewee's point of view;

5. The indexical components (trajectories) are compared across the interviews;

6. Finally the comparisons are put into context and similarities are established so that a collective trajectory is established and thus can be reported in the organisational story.

It is important to note that narratives are always embedded in the narrator's context and personal viewpoint of that perspective (Jovchelovitch and Bauer 2000). They are therefore highly subjective and may even be contradictory. They are the individual's personal construction of events and happenings through their personal understanding and knowledge of events. They connect these events in a direction of order where causality is implied but not actually stated (Le Guin 1980). Narratives are complementary to organisational story telling, they are to do with how the happenings are interpreted by the members of the organisation under study. They are subjective and perspective-ridden and are valuable for this very reason (Riessman 1993). These narratives are not included as part of the organisational story but the stories that they told are embedded in the fabric of the organisational story of UofB.

4.8 Conclusion

This chapter explained and discussed the research methods and the methodology utilised to undertake the study. It was argued that the study was conducted trans-paradigmatically with a sociotechnical perspective.

The main epistemological approach taken for the study was subjective and interpretative, utilising a variety of methods to report the findings – case studies, through organisational story telling and narratives – and grounded data techniques that allowed for inductive textual data analysis. A corpus construction for interview selection was performed. Two sites were studied and triangulation of data and analysis were performed, through the multiple methods used, in order that a principle of suspicion could be maintained.

Chapter Five tells the organisational stories discovered from this research and Chapter Six puts forward the propositions discovered and the weaknesses identified in the SPIS process of the organisations under study.

CHAPTER FIVE

Strategic Planning for Information Systems – the Practice

5.0 Introduction

Here is told the story of two universities – each different but with a number of similarities in terms of size, market segment and location. Due to origin and leadership style each has developed its own distinct culture and attitude to its environment and its organisational tasks. These two universities – UofA and UofB - operate thus in two different organisational modes. These universities and associated colleges etc. are identified by codes to permit anonymity.

Their stories are told as explained in Chapter Four in five stages, reflecting the build-up to their developing (or not and why not) an information (or information systems) strategy and the supporting IS and IT for this strategy and the climax (es) that occur before resolution. These are continuing stories, resolution is not complete, and thus the stories tell only the occurrences until data collection stopped. Further data collection would change the learning and new behaviour sections of the stories and – perhaps – further crises may occur that will warrant more or different organisational learning.

Data for the stories was derived from the archival material and public domain material as described in Chapter Four, plus the interviews and narratives (even when not explicitly acknowledged), which were used to construct the organisational trajectories (indexical components). These documents and material are identified in the text through codes – for example Minutes of a committee meeting in UofA are identified with the letter 'M', and reports created in UofB are identified by 'UTR' etc. Multiple references to the same document are indicated by subscript letters of the alphabet e.g. UD13b. Narrative details are described by the job role of the person interviewed such as MIS Manager or Data Analyst, or in the case of direct speech quotations from the interview transcript, by the initials of the person speaking e.g. PH.

Chapter Four shows the methods and methodological theories under which the research was performed and Chapter Six explains, in depth, the methods through which propositions were formed as a result.

Qualitative research begins at the beginning; it does not end with the data analysis but requires a return to the field for contextual validity (Trauth 1997). Thus in this chapter the organisational stories are told in their contexts – their settings. The organisational settings validate the organisational actions and reactions. The overall setting is fully described in Appendix Three but here significant external occurrences and changes are drawn into each story in order that the internal actions may be seen more clearly. The field data was returned to during and after these organisational stories took place as organisational reactions can be more clearly seen in hindsight.

The issue of triangulation as discussed in Chapter Four Section 4.3 was to some extent alleviated in the cases by the final interviews conducted after the initial story writing, which were used as confirmatory interviews of the story told.

5.0.1 The University Environment

The last two decades of the Twentieth Century were a period of significant change in the UK's higher educational sector. Development of the sector had to deal with a legacy of inappropriate systems and thinking. Prior to the creation of the Polytechnics and Colleges Funding Council, in 1989, polytechnics were part of the local government provision alongside schools for the under 18yrs age group. Removal from local authority control produced an upheaval in governance; financial and legal status; management styles and structures (DES, 1989) that was compounded by the acquisition of university status in 1992. At the same time the student intake demographics changed. All these external factors had a profound affect on their internal activities. Against this background of significant change UofB and UofA were created as 'new' universities from polytechnics. As universities they needed to review and revise their ways of operating and the information systems that supported them. As the 1990s developed, the Governments in power issued a number of White Papers and Reports that affected the funding and future aims of the sector. In many cases one Government denying the aims and objectives of

the previous Government and their Ministers even when the same political party ran the Government. A change in the political party running the Government in 1997 created a new climate of hopes and expectations and signalled a start to yet another period of upheaval and expansion. In Appendix Three is detailed the timeline and story of the last decades against which background the stories of UofA and UofB are played out.

Section 5.1 tells the story of UofA and section 5.2 the story of UofB.

5.1 The UofA Story – Operating under Constraints

Here is told the story of UofA. There are five parts to this story. The first part is the organisational and environmental landscape - the setting within which the university operates and undertakes its activities. The second part of the story is the build up to the formation of a strategic information policy and set of systems to fit this policy. The organisation undertakes a number of investigations in order to discover the best policy and systems for their purpose. In the third part, the story shows the organisation under semi-crisis as they have to choose and issues are deferred or ignored. In the fourth part of the story it is shown how the external influences and the internal activities mean that the organisation has to re-organise its activities as a result. Finally, the organisation undertakes new behaviour patterns as the new systems come into operation.

5.1.1 Setting

UofA is a UK organisation, which evolved from a Polytechnic to become a 'new' university when it received its charter in 1992, together with the other polytechnics. It now covers some 20 sites, with four main campuses. These sites are to the north west of London, with no two sites more than about 25 miles apart. At the time this story is written, the University offers more than 400 degree and diploma programmes.

The origins of UofA lay with a post-Second World War technical college. Prior to its incorporation as a university in 1992 it was relatively small in size with just over 5000 full-time and nearly 2000 part-time students in the academic year 1989/90. These figures rose to over 10,000 full-time and nearly 3000 part-time by the time of incorporation (R4a 1994). Part of the rise in students was due to the merger with A* College of Art and

Design completed in September 1992 and part due to joint Diploma provision with A* College of Health Care Studies (later also merged into UofA in 1994), as well as a generic increase in recruitment and strategic partnerships with Associated Colleges.

There was a continuing plan for an increase in student numbers on a year-by-year basis due to the new role as a regional university that the organisation would be undertaking post 1992. This would be partly achieved by expanding numbers recruited to the Associate Colleges; partly achieved by increased access and widening participation initiatives (as a result of Government policy); and partly achieved by further mergers and contracts for specific training initiatives. Thus A* College of Nursing and Midwifery was also subject to a merger initiative during the early 1990s and the result was the acquisition of training contracts for nursing and midwifery from Regional Health Authorities. The strengthening of the health care expertise led in the later 1990s to the establishment of a Postgraduate Medical School and the award of a training grant in 1999 to provide postgraduate training for clinical psychologists on a three year doctorate programme.

The UofA Mission (as established at the time of university incorporation) was:

> "To provide an accessible, comprehensive and quality system of higher education and advanced training which is responsive to local, regional and national requirements." (R4c 1994 p (i)).

Over the period of this organisational story this mission statement was a subject of debate and in due course the mission was amended to the following:

> "To provide a wide range of higher education with a commitment to excellence in teaching, learning and research and which is responsive to regional, national and international needs." (UofA website 1998).

This change in mission statement also indicates a change in strategic focus. The later mission statement is all-inclusive with a sense of balance between teaching, learning and research that reflects the Government attitudes towards the purposes of universities (see Appendix Three for details). However, it is also very generic with little to differentiate this university from others within the broader university sector. The local perspective emphasised in the original mission is clearly still regarded as a strong emphasis in the

university's publicity materials of the 1990s but has fallen out of the revised mission statement. Yet throughout the period under consideration ties within the local and regional network through work with the Associate Colleges continued to be strengthened.

The Associate Colleges – A1* Regional College, A2* College, A3* College and A4* College – were first brought into the network in 1991. By the academic year *1999/2000* some 16000 full-time and 1000 part-time students were undertaking higher education in these colleges under the auspices of UofA. This network was strengthened still further in 2000 by the formation of the UK's first Higher Education Consortium by UofA and the four Colleges. This was subject to new funding arrangements by The Higher Education Funding Council (Hefc) and the development of new sub-degree programmes in collaboration with local employers and the Regional Training and Enterprise Council (TEC).

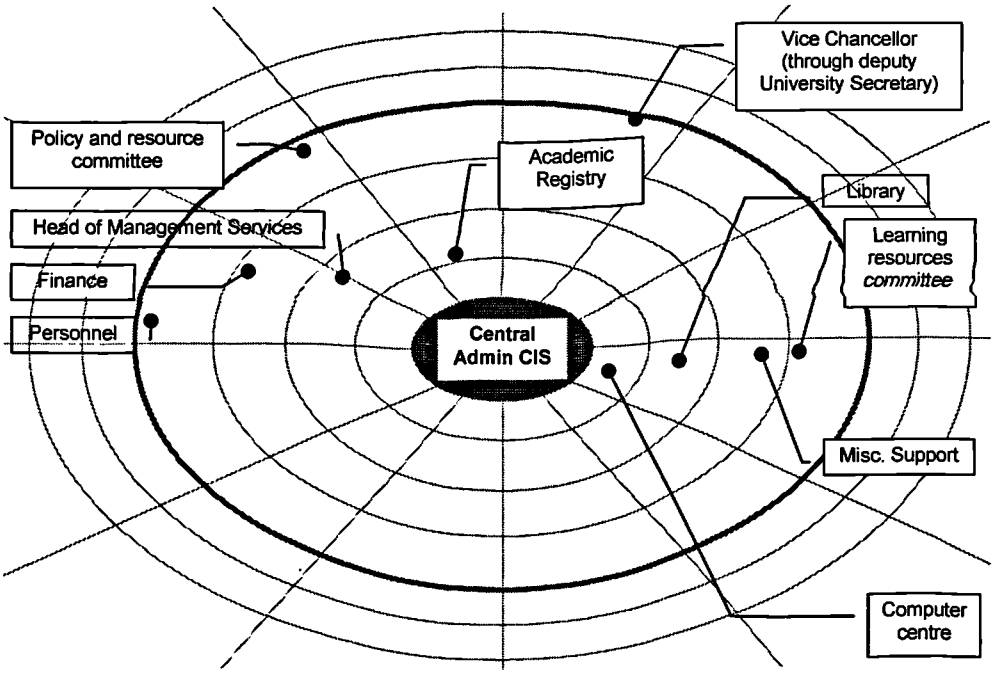
5.1.2 The Constraints Build-up

Becoming a university in 1992 was a time of great change for the organisation and as is discussed above, was the impetus for a period of further growth and change in configuration and size.

In order to accommodate the first stage of growth and change several new computer information systems were introduced in the year 1992. These included a Student Record System (SRS), plus systems for buildings and estates, research and consultancy. The Vice Chancellor was concerned that such systems should not be implemented in an ad hoc manner but that they should have reference to, and be supportive of, the overall organisational strategic plan. Thus in 1993 a standing committee – the Information Systems Strategy Group (ISSG) - was established (D1 1993). The eight initial members of the committee were simply nominated by the Vice Chancellor. The Chair came from the Library and Media Services Department; the committee secretary from Academic Registry; the other representatives being one from each of the following departments - the Computer Centre, the Academic Registrar, Management Services, Financial Services, Personnel, and the Deputy University Secretary and Registrar.

Figure 5.1 shows the initial nominated representation of stakeholders in this apparently arbitrary committee membership. They all represent internal centralised interests and congregate along the management and academic services axes. The two resource committees are represented by cross-membership. There is therefore a tendency for the group to be the central administrators rather than those who provide the institution's main line of business - teaching and research - or those who fund or benefit from the organisation's activity. Representatives from the Schools of Study were nominated by October 1993, and further stakeholders were also nominated over the life of the committee.

Figure 5.1. Committee Membership in September 1993



The stated strategic objectives of the IS Strategy as it was devised in 1993 was to provide:

> "Efficient and well-co-ordinated administrative and financial systems, able to respond to continuing growth, while providing the flexibility required by students and staff; improved access to management information; and a competitive edge for the university, both in the experience of its staff and of its students." (D13 1993).

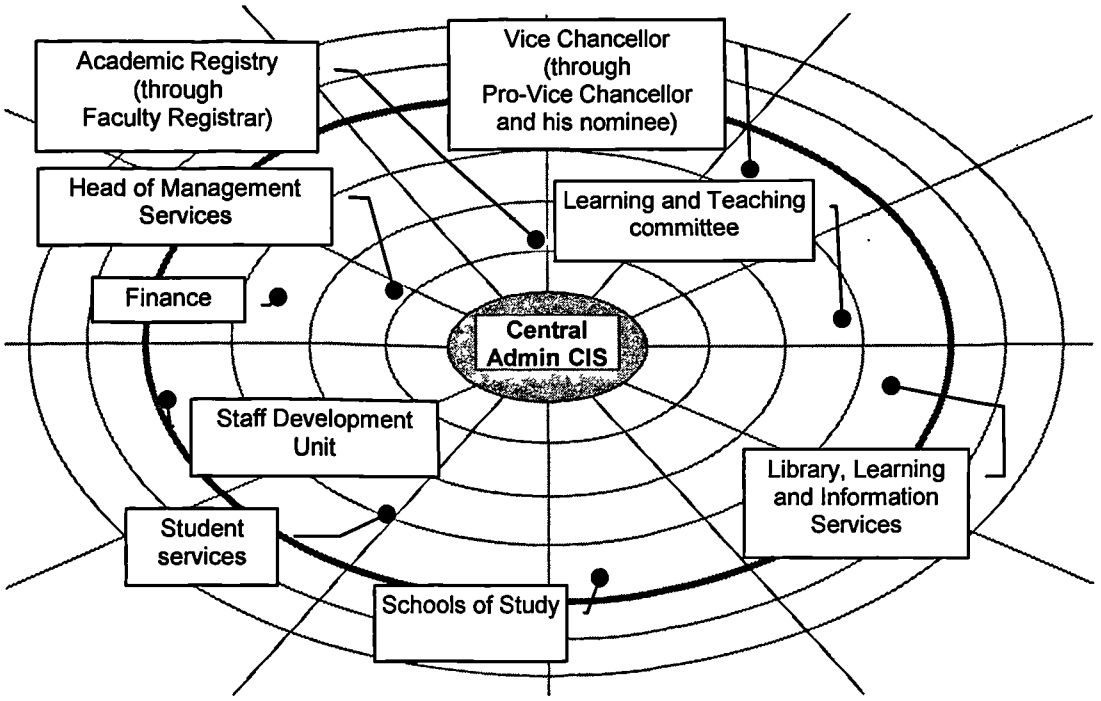
It was noted that the IS Strategy underpinned and contributed directly to the achievement of the mission, aims and overall strategic objectives (R6 1994).

The human issues of implementing new central systems were also considered important and as a result a programme of pro-active 'vigorous' information dissemination and consultation was begun in late 1993 (M4). Indeed, since its first meeting in 1993, the committee had invited non-members to attend meetings or to participate in its activities either directly (for example by commissioning reports) or indirectly through its own consultations. For instance during 1994 and 1995, the committee undertook a large consultancy exercise throughout the university inviting comments on the strategy documents and proposed systems they had put forward.

Examples of additional stakeholders invited to attend were (in 1993) the Head of Student Services; a representative of the Student's Union; (in 1994) a representative from Research; and (in 1995) a representative from External Relations. Stakeholders also nominated themselves as needing representation and were invited to join the ISSG. Examples are the Counselling Service and the Student Records Office in 1994, and the Equal Opportunities Officer in 1995. In addition, the committee, through cross-membership, was represented in, and had representation from, a number of other internal committees, including the Academic Board, the Learning Resource Committee, and the Working Party on Administrative Systems.

By December 1995 there were some 25 official members of the ISSG during the major decision-making cycle of this committee, falling to around 20 in 1997 when the committee was re-constituted. The Information Strategy Committee (ISC), as it became in 1998, consisted initially of 11 members but within four months it had increased to 15 as shown in Figure 5.2. The committee Chair came from the School of Information Sciences, other members were taken from Student Services, Management Services, Learning and Information Services and a representative of the other 7 Schools of Study. Later invited additional members were the Chair of the Learning and Teaching Committee, the Staff Development Committee, Management Services and the Pro-Vice Chancellor of Finance and Planning was an occasional attendee.

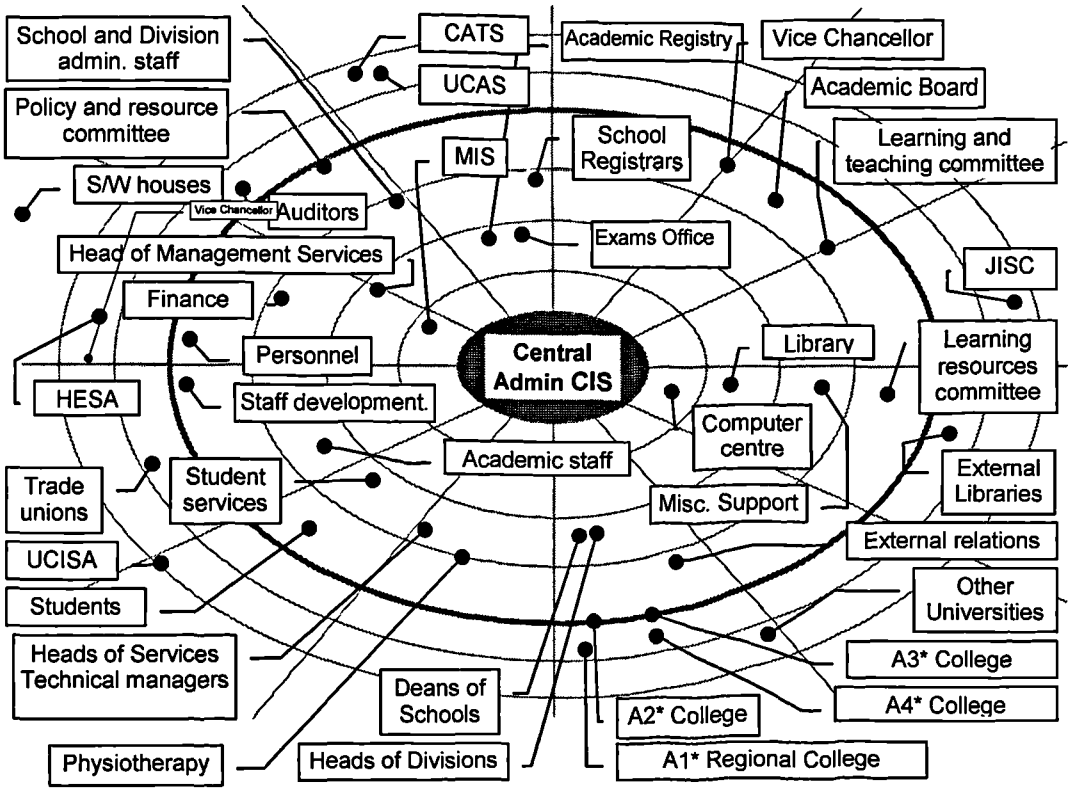
Figure 5.2. Stakeholder Web Showing the Revised 1998 Committee



Other interested parties external to the organisation were also in constant touch with the committee through key members, and many JISC (Joint Information Systems Committee[1]) papers were considered at the ISSG and ISC committee meetings and issues raised were discussed and responses to JISC papers were submitted. The stakeholder representation derived from the committee papers, achieved by this steering group over the period under consideration by this story was considerable. Figure 5.3 shows this representation in the form of a stakeholder web.

[1] A UK government body which manages and gives advice on university information systems

Figure 5.3. Stakeholders Represented on Steering Group Between 1995-1997[2]



2

CATS	Credit Accumulation and Transfer Scheme for students moving between universities
HESA	Higher Education Statistics Authority: a UK government body responsible for the collection of university statistics and other details used for government funding purposes
MIS	Management Information Systems Department
UCAS	The University Clearing and Admissions System is the UK's central clearing house for undergraduate admissions
UCISA	University and Colleges Information Systems Association
S/W Houses	Software Houses

(Note that the placing of stakeholders on the web was performed by the researcher according to her judgement of which segment they related to, as identified in the records consulted. Stakeholders are grouped into web segments according to their working relationships and interest alignments, thus Trade Unions are placed in the same segment as Academic Staff, and Students with Student Services. The heavier grey line indicates the organisational boundary and thus stakeholders such as CATS are placed outside this boundary as they are external Government agencies but have a relationship with Academic Registry, similarly HESA has a relationship with the Finance Department and these external stakeholders are therefore placed in the same web segments as the internal department with which they have a relationship. Nearness to the system in use is shown by the concentric circles. The more impact on daily working life the system under consideration has on the stakeholder, the closer to the centre they are placed. The web thus indicates a visual representation of stakeholder interconnectedness.)

5.1.2.1 Strategy build-up

Having been constituted at the beginning of the academic year 1993/4 it was not until January 1994 that the first (draft) ideas of information, and information systems strategies, were ready to be presented to the organisation as a whole and to the senior management in particular. The draft strategy for IS stated that the first strategic objective was to provide:

> "Efficient and well co-ordinated administrative and financial systems, able to respond to continuing growth, while providing the flexibility required by students and staff." (R1a 1993).

The ISSG, in devising this strategy recognised the need for staff involvement in evolving the strategy and managing the subsequent implementation, including the re-design of information flows (R1b 1993).

It was recognised that the existing systems provided limited information that could be expanded (in suitable report format) to provide more extensive details to suit local needs.

Initially the plan called for a core of common data across all administrative systems, which could be universally accessible, was non-confidential and would provide the basis for local additional data in various Administrative departments, to be identified. But this

proved problematical, no agreement as to what this 'core' could be was reached and the idea was subsequently dropped (M3b 1993). Instead the task forces for the ISSG were to look at overall administrative needs. It was noted by the ISSG (M3a 1993) that reliable, proven, sophisticated and effective integrated systems had been operating successfully in the private sector, but had been proved difficult to achieve in the university sector.

It was recognised (R4a 1994) that the strategic aims were to provide efficient and well co-ordinated administrative and financial systems, able to respond to continuing growth, while providing the flexibility required by students and staff. In addition to providing such proven effective and reliable integrated systems, the strategy also required improved access to management information. Laudable and justifiable aims that needed to be achieved quickly:

> "so as to avoid 'planning blight' for major systems which will need replacement soon." (R4b 1994).

Practical outcomes expected from the introduction of a new integrated system included:

A single student identifier (i.e. number);

A student record created and used as a carrier from UCAS application onwards;

Marketing data on the origins of students, and other information such as failure tracking;

A powerful and user friendly finance system;

A UofA course database available to schools, colleges etc available on-line, on disk or on a CD-ROM;

Students able to enter their own course options using the system;

A room-timetabling facility;

Data such as HESA statistics, equal opportunities information etc gathered more easily;

Access control system for rooms, laboratories etc;

A 'smart card' system for University-wide use to save cash handling, speed up sales and generate management information;

A staff database, including research activity, publications and other topics (R4a 1994).

It was considered important that not only should current and evolving standards in the (computer system development) industry be taken into account, but that the final. developed system be capable of evolving and changing in response to future (as yet unspecified) needs.

Four ways forward to achieving the implementation of such new CIS were considered in the committee deliberations of the first months of 1994, of which two were considered worth pursuing – that UofA should consider purchasing discrete packages all using the same technology (such as a relational database) or that UofA should consider taking part in the existing (university) co-operative developments for administrative systems, such as the MAC (Management and Administrative Computing) initiative. Thus discarded were the options of building systems in-house or of purchasing discrete packages for each application's requirements without necessary consideration for linkages or common interfaces (R6 and R16 1994). This was to prove an interesting decision, as it was later to be shown by their actions that not all members of the committee stood by this decision.

The MAC initiative was a Government sponsored initiative with four 'families' of systems under development. Consortia of universities had got together with three database software houses to specify and develop jointly, integrated administrative systems for the 'typical' university. These software houses were Oracle, Ingres and Powerhouse. Potentially it seemed that the MAC initiative offered the most fruitful way forward and thus should be investigated in detail, although it was accepted that as the MAC initiative was developing systems for the 'typical' university and as UofA was atypical (as indeed, in reality, all universities are) any such offering would require tailoring to a greater or lesser extent to the university's own specific requirements.

In late 1993 a briefing paper was submitted to the ISSG by RWB (member of the MIS department) relating to the MAC initiative and detailing the background to the development and the participating software houses (RWB 1993). There were four 'families' identified: the Delphic; the Powerhouse; the Ingres and the Secqus. Each family was evaluated in its strengths and weaknesses. No stars were identified but the Powerhouse family was particularly mentioned as having had a less than smooth

implementation process so far. In particular the Payroll/Personnel module was singled out as allegedly one university had bought it and then thrown it out. This was to prove interesting in later years, as UofA also experienced difficulties with this particular module of their chosen central administrative system. The Powerhouse family contracted with company C* for software development.

The ISSG agreed that the original specification for the MAC initiative, as drawn up by PW* (a consultancy company) would provide a useful starting point for any UofA specific projects. Initially it was agreed that the university was to follow the Delphic family (M3a 1993) route with an Oracle database. In the RWB briefing paper described above, it was noted that two of the seven components had been completed and delivered but that delivery on the remainder (of the Delphic offering) although past due, had not been completed. UofA recognised that it was not yet ready to take on board the full (or indeed any part of) the Delphic solution yet as considerable planning was required. However, the ISSG stated that the Delphic components would be phased in, as they became available, and as UofA had the capability to incorporate them and train staff. There was a concern that some areas had 'exceptional' administrative needs that challenged the concept of a single integrated management system. Thus total integration was a long-term aim rather than an immediate goal. In addition, it was intended that access to the systems would be less restrictive than it currently was, and should, in time, take on the needs of the evolving relationship with the Associate Colleges.

It was decided that to progress choice of system further, a more formal consultation process would follow demonstrations for the user community and proposals would then be put to the Senior Executive Group (SEG). Roadshows were thus initiated during 1994 for consultation across the departments and campuses. These roadshows and department meetings raised a number of stakeholder concerns about security and confidentiality of data on integrated systems (D19, D20, and M14 1994). Other points raised during this period of consultation related to concerns about the correct choice of database engine (M12 1994); information and data accuracy (D69 1994); organisational change both as a result of the new systems (D68 and D71 1994) and on-going administrative and structural change that might impact system design and choice (D68 and D12 1994).

General comments on the strategy – which had been circulated in report form amongst senior academic and faculty staff were cautious – there was:

> "A sense of doubt that the university would actually provide the resources required to implement the proposals properly." (D14 1994).

Many stakeholders held the belief that staff were not very interested (Int1, Int2, and Int5 1994). It would seem that there was an element of apathy from stakeholders and the committee commented on the low turnout at departmental meetings (M13 1994) and roadshows (M14 1994), and the fact that some stakeholders – even when invited to attend meetings – rarely turned up (M8a 1994). The committee continued a programme of roadshows over the years of their activity but the attendance continued to disappoint (M22 1995, M44 1999). This apathy also extended to the Associate Colleges who were invited to participate in the strategy forming process but never actively did so.

Initial consultation within the user community also suggested that the Finance and Personnel systems were in need of replacing within a short time span. The SRS was of less urgency but would need replacing in due course, as the database software on which it was based was unlikely to be supported in the long term. In addition, there was a need for increased functionality due to changes in practice and course developments within the university and additional systems for academic quality monitoring, timetabling, research, marketing and payroll would be required (D75 1994).

The ISSG had no power to make decisions, only recommendations at UofA. Power was vested in the SEG who also controlled financial decisions, the SEG being a small group of senior managers with no cross-representation on the ISSG. The SEG consisted of the VC, the Pro-VCs, the Director of Finance and the University Secretary – who was also the Registrar. The SEG was not a formal committee of the university and was not to be found on the organisational chart but nonetheless had power as shown above. Financial decisions were also made by the Finance and General Purposes (F&GP) committee who devolved the budget to the SEG. Large projects needed to go the F&GP committee for their final sign-off. This lack of influence (by the ISSG) on the decisions of the SEG caused some frustration and unhappiness when decisions made by the ISSG were over-ruled by the SEG. In 1994 the SEG decided that the first priority was to replace the

Finance system and that the timetable for the implementation of the required systems was:

Finance operational by September 1995;

Research operational by June 1995;

Personnel operational by March 1995;

Payroll operational by December 1995;

SRS operational by March 1996 (M8a 1994).

The ISSG accordingly set up working groups to obtain user requirements and to compare the MAC offerings for the various proposed systems with a remit:

> "To consult widely with users of both the present student records and finance systems before submitting any recommendations." (M8b 1994).

Each working group would contain one representative from the finance department, one representative from Management Information Systems (MIS – the university's system management department), a Dean of School or head of division, a School Registrar and a co-ordinator. In all cases the co-ordinator was TS – the head of MIS.

The decision to recommend first and implement first, a finance system, was not looked on favourably by the Student Records Office. They expressed their concern that, although the finance systems must needs be in a 'family' with the SRS, they were not going to be able to influence the purchase decision in any way. In particular they were concerned that UCAS was requiring changes in reporting from them for the academic year 1995/6 which needed to be considered (M9a 1994). Additionally, as noted above, the Student Records Office was not represented on the original committee and had to 'lobby' for position. It was therefore agreed that the working party on the SRS should meet earlier than originally planned according to the timetable set by the SEG.

Over the first half of 1994 a number of strategic plans for systems were drafted and redrafted by the ISSG. At the same time the working groups evaluating the MAC initiative in four areas – Student Records, Finance, Personnel and Research – had been meeting and producing checklist questionnaires for the system vendors. However, the

straightforward choice between MAC systems was complicated in the latter months of 1994 by the approach of S*, an American software company who wanted to break into the UK market and needed a pilot site. In addition, representatives from both the Finance and Personnel Departments were actively considering systems outside their remit, as they were concerned about the standard offerings.

By November of 1994 the task groups were ready to report on their comparisons of the MAC offerings. The Powerhouse systems (offered by C*) were considered, despite the concerns over these systems expressed by RWB as detailed above, to have a small margin of advantage over the Oracle offering and were more established with considerably more live users in existence. However:

> "The Task Group felt strongly that at its present degree of complexity it would be virtually impossible to represent adequately all the subtleties of the university's academic structure, with wide variances in practices at schools level, divisional level and even in different schemes. It therefore recommends that the current structures should be fully documented and that these structures are then reviewed with a view to simplification." (WA7 1994).

Thus changing the university to fit the system rather than vice versa. The working groups also compared the system offered by S* to that offered by C*. They still favoured the C* system due to the S* system's need for increased customisation through its American origin. However they noted that within the university there were a number of groups working towards a reform of the academic provision and resultant structures and they were in fact trying to hit 'a moving target'. It was agreed that it was unlikely that there would be a system that would meet everyone's needs fully as evidenced by the feedback received during the consultation process. In addition there was concern that investigating the S* system in depth would hold back the implementation. Dates and system priorities were now agreed as 1995/6 for Research, Administrative and Finance systems. The VC announced that an interim report should be presented for consideration, by himself and the SEG, by April 1995 and a final report by September 1995. Thus the initial dates for the first system implementations were over-ruled.

5.1.3 The Constraints Deepen

By May of 1995 no decision had yet been made as to which route for CIS purchase to go down. Other universities were also evaluating the systems and UofA were monitoring their comments. Personnel were not happy with any system and were proposing to find their own and had arranged a number of site visits and meetings with software houses to discuss this further. When consulted in 1995 finance staff preferred S* to C* (WF5) and were still interested in the possibilities offered by stand-alone packages but the working party tasked with evaluating the alternatives required to be convinced that the functionality gains would outweigh the loss of integration (WA8 1995). The working group for Marketing and Research also seemed to prefer the quality and maturity offered by the S* system. Their concern relating to C* was the modular aspect of its construction and thus the related data integration issues (WA8 1995).

Nonetheless in June (WS1 1995) a final recommendation was made to go with the C* system but with a note that the system was being offered by the M* group that seemed to be currently in a state of flux and subject to mergers and re-organisation. However, this decision was subject to verification by *initially the university auditors who monitored all* negotiations with suppliers for thoroughness. It would then need to be submitted to the SEG for ratification and a formal EU (European Union) tendering process begun. By September of 1995 the process of tendering had begun with C* - Personnel had agreed that, with suitable modifications the C* Personnel system could be used and Finance had agreed not to look any further at potential systems.

In October the Associate Colleges expressed interest in sharing (some of) the software currently being considered as network connections to their sites were due to be completed by the end of the year and the financial system could thus be shared. However there were a series of negotiations under way during November between the university's legal advisers and JISC that might result in a delay in implementing the Finance system if not the SRS. Also complicating decision-making was the requirement of some members of staff that the systems be Apple Mac compatible. Finally, there was a collapse of the MAC initiative even though the software houses continued to operate and offer their systems for universities. The university was thus left with a choice between an

American system and a UK system no longer part of an organised group and thus not following the 'typical' route. In fact the system that UofA now had to consider from C* was a new system and UofA was given the opportunity of becoming the beta test site.

During this period of decision-making the Personnel system sponsors changed and the requirements for the system were under a constant state of flux, partly due to internal changes and changes in expectations and partly due to external requirements (from Government agencies) changing. All these changes in view and expectations meant choosing became increasingly difficult, plus finalising a specification was near impossible.

The final decision was not a committee decision. TS, the MIS manager, made an agreement outside the committee system to take on the beta test of what C* called Project G* for an incentive (i.e. reduced cost price).

5.1.4 Moving On

By 1996 the committee, although it needed to remain to oversee the implementation of its plans, felt that the strategy had been largely decided and that the university's future aims needed to be defined before further IS/IT priorities could be decided. Thus their role, function and future direction came under discussion, but it was not until 1998 that the committee was disbanded and replaced by the Information Strategy Committee (ISC) with a remit to advise university management on appropriate use of IS for the realisation of the strategic aims (SD1 1998) but they required a 'strong and detailed steer from Senior Management' (M36 1998).

During the period of constitution of the original ISSG committee, a large number of projects other than the central administrative suite were considered. Many of these systems had internal sponsors not all of whom were actual members of the ISSG, although they made frequent 'guest' appearances. Examples of systems that were sponsored by someone outside the committee were the university smart card and video-conferencing, and sponsored by someone inside the committee was the university Intranet development. In the case of video-conferencing there were two major sponsors, one of whom left the university during this period. The idea was discussed not only in the ISSG but also in the Learning and Teaching Committee, but due to a lack of strong

sponsorship in either committee the idea was bounced back and forth between the committees and never fully realised.

Systems that were strongly sponsored on the committee such as the Intranet were sometimes over-ruled by the power-holding SEG. The SEG considered its judgement to be superior to that of the ISSG and withheld money for the web developments initially. The developments however, continued to go ahead, with various departments sponsoring the development from internal budgets until the SEG recognised its importance and provided suitable funds.

An interesting development was that of the Personnel/Payroll sub-system. As noted above, there was a change in sponsorship of this system during the decision-making process that led, finally to the system being considered as part of the Project G* system. However prior to this payroll had been performed by a bureau service. C* had no payroll module available within their initial specifications for Project G* and so offered a third party system for integration. This was considered by Personnel to be inadequate for their needs and they continued to run the bureau system. Much later in the implementation cycle, Project G* picked up a payroll module that was considered suitable but there were issues integrating it with both the Personnel and Finance systems that caused delays in implementation.

Some of the systems that were initially discussed as intended sub-modules of Project G* had a chequered life. Marketing was one such system. This was initially developed through 'executive action' – that is it was developed as a stand-alone system by the department concerned, utilising their own budget and own resources (even though it was intended to be part of the central suite of programmes the department could not wait for the final implementation). As Project G* developed, modules for contact management and alumni management became available within the central suite, and thus G* 'swallowed' up the functionality of the marketing system.

Timetabling, another system that was intended as part of the central suite, did not become integrated into G*, it remained outside during the period under discussion in two

separate forms – one for normal timetabling of rooms and classes and one for exam timetabling.

It became apparent as time went by that Project G* was not only taking longer than planned – not only by the original dates of expected implementation but also by the revised dates agreed with the software house. In addition, the budget for both manpower resources and money resources allocated for the development of this central suite of programmes was greatly exceeded. A further issue with Project G* was found to be that university ways of working needed to be re-organised to fit with the system – in particular in Admissions. Admissions was originally a distributed function in the university, but the new software proved more viable in a centralised mode, so departments were closed and staff moved to facilitate this new way of running. Other small changes in the way that the Finance and the Student Records departments operated also occurred.

In 1996 there were still concerns expressed about the (potential) lack of compatibility of Project G* with Apple Mac PCs. There were significant cost implications if the software was not compatible (M23a 1996) but the suppliers were hesitant about committing their selves to developing Apple Mac compatibility.

During the early part of 1996, four Steering Groups were formed to oversee the implementation process. The Finance, SRS and Personnel systems had a three-tier steering group structure consisting of a group formed from across the university, followed by an implementation group and at the lowest level a consultation group consisting of experts and users in the specific areas. The Research system being less complicated and de facto 'distributed' throughout the other systems in Project G*, formed only a Steering Group.

Each Steering Group attended several days of training at C* headquarters and produced, in consultation, a detailed implementation plan. Each Steering Group consulted with any 'missing' faculties or departments (i.e. those that were not represented on the group), and each Steering Group was monitored by the ISSG itself.

Administrative systems were still in a state of flux and a working party, led by the Pro-VC (Finance and Management) was still considering the academic structure of the university

and any rationalisation that were to be made. In addition, although there had been much thought:

> "Given to the type of information to be handled by the systems, it has not been possible as yet, to make firm recommendations regarding such questions as the ownership of the data, its organisation and likely retrieval mechanisms. This will be part of the implementation plan." (R11 1996 p7).

Later in April of the same year (1996), TS reported to the ISSG that there were two areas of concern relating to the Finance system – one that a member of the implementation team was leaving the university and that the system was now behind (the latest and most revised) schedule. In addition, the Personnel system was not progressing its issues with Payroll – no suitable system had been agreed and an important stakeholder of the SRS system was also leaving the university (WF2 1996).

In July of that year a proposal was made that a road show would travel around the three major university campuses to enable 'outlying' stakeholders to see what was being proposed and implemented in the way of new administrative systems. It was intended that this road show take place in the November of that year.

In September further areas of concern were reported back to the ISSG by TS (WF5 1996). The liaison consultant for the Finance system at C*, had left the company and was to be replaced, the contractor for tailoring the system had failed to turn up and little progress had been made during August and September as the university was concerned with its year-end audit. However a second test system had been set up and the initial data conversion specification had been completed with a pre-release version installed. The Personnel system was still having issues relating to the Payroll aspect and there was a lack of support and integration from the company concerned. The matter had now been escalated to the Managing Director of C*. Implementation of the Personnel system had been delayed until April 1997.

The SRS system was progressing with a pre-release version installed, some reports specified and training completed. However there was an area of concern relating to the impact of the re-organisation required on the Admissions Department. In November the new Admissions system went live and worked smoothly, despite the fears above but

Payroll was still proving a thorny issue and contracts relating to its purchase still needed to be signed.

In February 1997 TS reported to the ISSG that the admissions and enrolment system had not only gone live but that 16,000 applications had been received and logged onto it. The system was working reasonably well but new software had been received and was in the process of being tested before installation (M28 1997). The overall SRS was now expected to be completed and to go live at the start of the next academic year i.e. October 1997. At the same time it was reported that Finance was still experiencing some difficulties with their system and still had to finally go live. They anticipated this happening in June 1997 along with the (now) agreed Personnel/Payroll system.

By April things relating to the Payroll systems looked somewhat more problematical again as there were difficulties with the contracted third party and the interface between the personnel system and the payroll sub-system. This now meant that it was not anticipated that Payroll would go live before April 1998 (M29 1997). There was also a delay with the Finance system, which now was expecting to go live in August despite the outstanding issues still to be resolved. The SRS implementation was proceeding according to schedule but not without some difficulties as C* personnel changed and data collection had been slow and was still insufficient to permit staff training. Such were the implementation issues still outstanding that a member of staff had been contracted from IC* (another organisation) in a chasing and co-ordinating role.

In November the ISSG reported that Finance was likely to slip past the (new) implementation date of April 1998. Difficulties were still being experienced during 1999 despite the finance element now having being installed (and still incomplete) for nearly three years (M43 1999). In fact it was not until late 1999 that the steering group were satisfied that:

> "Finance is alive and working well.. (but) the invoicing of students had been delayed due to the lack of quality data from the Student Loan Company." (M47 1999).

And in early 2000 it was finally agreed that the Finance system was generally running well if somewhat clumsy and/or troublesome in parts; the Personnel system was operational

and the interface problems between the old and new systems were being resolved with future developments in plan; the Student Records system was still subject to some structural problems in parts and a round of meetings to resolve these issues was in progress (M48a 2000).

5.1.5 The New Environment

Thus by 2000 most parts of the new strategic IS system were in place and operating to a satisfactory (minimum) level and the IS strategy had been established as far as practical.

The committee – now the ISC – still continued to meet but with, as noted above, a revised remit. A meeting with the company now owning C* had been held where a three year plan had been revealed including new acquisitions of software companies which would enhance the G* system (M48b 2000).

In January 2000 an Information Strategy Review was carried out and a new document produced with revised deadlines for projects. In it, it was noted that a number of proposed projects had been shelved and no further action was intended. These projects included the proposed Document Management system that was abandoned in 1999. Most other projects under way had revised deadlines increasing due dates from a few months into the future to in some cases years. Even where updated deadlines were not quoted, there were notations that existing deadlines may be unrealistic. This document was reviewed on a monthly basis and deadlines amended as required.

Additional stakeholders were also considered necessary for this committee and the membership increased on a regular basis both with appointed members as well as invitees for specific events. By mid 2000 there was a regular membership of 16 academic and faculty staff.

Workshops were still being held in relation to G* and as a result there had been many modifications to the system 'which were being used with varying degrees of success by different Faculties' (M50 2000). Regular training courses were also held during the year.

Much of the work on the Information Strategy was now concerned with developing the university web presence through faculty websites and the Intranet. Each Faculty was

developing in a different manner – some had their own Information Strategy Committees, some had developed intranets, others had plans to develop intranets for both students and staff separately. Progress was hindered in developing consistently as some staff in a number of faculties were still using Apple PCs or were on the student network rather than the staff network. The revised strategy was to be disseminated through a presence on the university intranet and through a roadshow presented late in 2000 at all campuses. A video of the roadshow was made so that the event could be shown to non-attendees later.

5.1.6 Conclusion

The story tells us that UofA is a university operating under constraints that are both of its own making, and also as the result of external pressure.

It is clear from the above story that UofA used a steering committee structure to plan and run its project selection and management for its IS strategy. In the 1980s two articles were written considering the use of steering committees to select and manage IS projects (McKeen and Guimaraes 1985, Doll and Torkzadeh 1987 – see Chapter One for a full discussion of these papers). In these articles they propose a number of conclusions or hypotheses about the role and actions of steering committees in relation to IS project selection and management.

McKeen and Guimaraes (ibid) offer seven hypotheses relating to the use of steering committees and five conclusions. The five conclusions being that overall steering committees favour:

Large projects in terms of man-hours to develop and large numbers of users;

Projects with little vertical integration;

Lower level projects (i.e. clerical to supervisory in application);

Projects with formal proposals with written cost/benefit analysis;

And projects which demonstrate tangible and intangible benefits.

We can see from the UofA story that the process in UofA follows that of the first three conclusions closely. Project G* was very large and concerned itself with horizontal

integration rather than vertical, in addition, it is concerned with the work at clerical to supervisory level although some management information would be drawn from it. There was some attempt to provide a formal proposal and cost-benefit analysis but not to a large extent (despite the use of a formal tendering system) and certainly tangible benefits were considered extensively – functionality against requirements - there is less evidence that intangible benefits were considered, if at all.

The hypotheses that McKeen and Guimaraes put forward also suggest that the use of steering committees favours projects that are part of the corporate plan. Whilst the evidence in their article did not support this hypothesis, it is evident that in UofA the initial projects were strongly targeted to the corporate plan, although later developments were not so.

Doll and Torkzadeh (1987) draw four conclusions:

1. An MIS steering committee is associated with the existence of an overall written plan for systems development in both large and small organisations.
2. An MIS steering committee is related to increased sophistication of planning and budgeting practices in both large and small firms, and separate plans and budgets for maintenance and development
3. In a large firm existence of an MIS steering committee is associated with mutual agreement on a set of criteria for deciding which projects to do first.
4. Existence of a MIS steering committee is associated with management making a long-term commitment to provide stable funding for systems development in large firms.

We can see from the story above that for UofA in relation to conclusion one, the Strategy plan covers some of this, but there is no evidence of a full, overall systems development plan. In relation to conclusion two the University is relatively sophisticated - they say this in their documents and their size and complexity is evidenced above. In relation to conclusion three this does happen, but changes in which goes first are due to external factors – the SRS comes up the priority list due to changes in HESA reporting requirements and changes in UCAS procedures. In addition, the committee does not make the decisions without 'prompting' from above which is sometimes resented. In relation to conclusion four we can assume that this is the case although not explicitly mentioned, however the evidence would show this to be true as projects were still on-

going and being supported with training and roadshows etc until the committee was satisfied that they were complete. It should be noted however, that this story stops before the committee has declared any projects complete. In Chapter Five, Section 5.2 this study now looks at the situation and the organisational story of the second case study organisation – UofB.

5.2 The UofB Story – a Story of Complexity

Here is told the story of UofB. A story of a university that is operating in a situation of complexity. A university balancing, it would seem, on the edge of chaos.

There are five parts to this story. The first part is the organisational and environmental landscape - the setting within which the university operates and undertakes its activities. The second part of the story is the search for a better fit to the landscape. The organisation undertakes a number of activities and changes in its ways of operating in order to achieve a better fit to the landscape in order to reach a higher peak of fitness. In the third part of the story the organisation is shown to be teetering on the edge of chaos as the landscape deforms around them and their fitness moves bring them too close to chaos and lower in the fitness landscape. The fourth part of the story shows how the landscape is deformed by external influences and the internal activities and the organisation now has to travel through this new landscape and re-organise its activities as a result. Finally, the organisation undertakes new behaviour patterns and begins its search for a new fitness peak. At the time of writing this new fitness peak has not yet been settled upon. The organisation is still searching and moving through the landscape.

5. 2.1 The Landscape

The story of the organisational landscape begins with looking at the formation of UofB. UofB was formed from a Polytechnic in the year 1992 along with many other 'new' universities. (For the history of Higher Education in the UK see Appendix Three). The B* Polytechnic had been established in 1991 as the result of the merger of four colleges – one college of HE, one college of FE, a Health Care Studies college and a Music college - under the direction of a new Vice Chancellor (VC) appointed in 1991.

The new VC had declared a new mission for UofB (without prior consultation with staff (The Lecturer 2001)) early in his tenure, stated as to 'support mass participation in higher education as a contribution to equality and social justice' (UD10 1993). The Vision statement showed that UofB wanted to become a university that was student driven with a major commitment to teaching and learning and with a diversity of students in ethnic, gender, disability and class terms. Its policies and tactics were designed to support these

aims. This new mission statement was widely accepted by staff of all grades and responsibilities. It represented a shared view and commitment.

In 1993 it welcomed B* as an associate college and then added a college of Art and Design by merger in 1994. In the same year it signed a major contract to train 1300 pre-registration nurses for twelve London hospitals. In 1995 a further five-year contract for nurse training was awarded by another Regional Authority. Driven by this success a college of Nursing and Midwifery and a college of Health Care Studies were integrated (merged) into the existing Health Sciences School. This expanded the student base and increased revenue-earning activities. Thus by 1996/7 UofB had around 27,000 students attending, making it the second largest university in the UK next to Manchester Metropolitan. Of those 27,000, 65% attended in a part-time mode through part-time attendance, distance or open learning methods, 9000 of these students were based overseas.

The student profile for the academic year 1995-6 was:

65% part-time;

40% non-white;

58% women;

63% mature students (over 21);

18% Further Education students;

20% studying with but not at UofB (e.g. overseas);

70% local students to site of study (i.e. to one of the campuses).

The Institute of Health Sciences (previously the Health Sciences School) was, in 1997, the largest provider of health education in England, with over 7000 students and 300 staff. In overall staffing terms UofB in 1996/7 had over 1600 full and part-time staff.

At first sight this student profile was amply fulfilling the mission of the university. The University League tables published in 1997 (Higher 1997) which were based on the data from 1994/5, showed UofB with 8 'A' level points as the median entry requirement, this had increased to 9.9 points in 1998 based on the 1995/6 data – ranking UofB 94th out of

96 universities in terms of entry requirements (Higher 1998a). This is a direct reflection of the typical entrant to UofB being from a non-traditional background (i.e. not through Sixth-Form education). The proportion of students achieving good honours (i.e. 2.1 and above) was constant between 1997 and 1998 – 45% and 44% respectively. This put UofB joint 88th in terms of achievement. Again in relation to Teaching Quality Assessments, UofB tended to rank well below average, achieving a mean score of 18.7 in the 1997 league tables and 18.9 in the 1998 tables – joint 86th of 96. In addition, the average RAE (Research Assessment Exercise) score per member of staff was 0.28 points (0.26 in 1998, the lowest score of any university), this despite two areas – Sociology and Linguistics, achieving the highest score of 5 out of 5 in the RAE. Such a low RAE score meant also very low funding being forthcoming as an addition to student funding, from the Government.

In order to fulfil its mission UofB set out to 'woo' non-traditional students into the fold, so as well as conventional full and part-time modules, UofB also offered short courses and mini-modules. The mini-modules were intended to be an innovative way of capitalising on staff strengths and interests and ranged from a variety of alternative therapies, to more conventional topics such as Languages or Computer Skills, through to recreational skills. Some of these were to be offered through Summer Schools as well as on a continuing education basis.

The university suffered from a shortage of funding right from its inception. So much so that it was reported in July 1994 (Ealing Gazette) that 1100 students had signed a petition relating to poor resources, poor IT, a shortage of books and an increase in numbers in the seminar groups. This despite the fact that the university was investing £5.6 million in bricks and mortar between 1992-4 including the opening of a new 82,000 sq foot Learning Resource Centre (LRC) – an enhanced library facility - on one site in October 1993 (UD10 1993).

The issue of poor IT was to test the university over many years; to begin to deal with it they formed a partnership with the private sector company C* to outsource the management of their IT facilities in 1993. This was a unique step amongst universities. After discussion with the unions (not always amicable), it was agreed that whilst the staff

remained employed by the university, their management was controlled externally by a third party. Later the New Learning Environment (NLE) required them to outsource a number of functions to a replacement company, II* in 1997. This contract was later considered by the University Governors to have been problematical with 'unsatisfactory cost and tie-in clauses' (JASa 2000). The outsourcing provision was beset by poor procedures and in 1995 the Teaching Quality inspection found Computer Science teaching to be unsatisfactory partly through inadequate IT provision, although a later re-visit found matters had improved sufficiently that it could now be classed as satisfactory.

5.2.2 The Search for Fitness

Constituted on two sites some twelve miles apart and centred on the two previous colleges prior to incorporation, UofB found that it was handicapped not only by the distance between the sites but also by the conflicting (original) college cultures.

One of the first tasks undertaken by the new Vice Chancellor in November 1992 therefore was a major re-organisation of the university structure. Ten Schools were created, each with new managerial posts and new teams of teaching and administrative posts. As a continuation of the re-organisation in January 1993 a process of 're-wiring' commenced whereby all existing administrative procedures were reviewed and overhauled – re-engineered – culminating with a re-organisation of the administrative posts late in the same year. It was considered by some (RWa 1998) that this second re-organisation of administrative functions was in fact an enabling tool for the third still to come. This was a major re-organisation of the way the university worked with the entire degree programme being revalidated including a re-organisation with departments and relevant staff also moving positions again. This third re-organisation took place over the period 1995-7, with the new structures and degree programmes coming on-line in the academic year 1997/8. Thus within six years there were three major re-organisations of structure and form.

Staff at the university believed that the re-organisations were deliberately breaking communication links, power bases and reducing the academic staff base (The Lecturer 2001, The Lecturer/ITAG Member 2001, The Lecturer/Researcher 2000). It was

claimed that indications of this were the removal of academic pigeonholes from the staff common room and re-siting them in each School. This significantly reduced the traffic in the common room – which had also previously provided coffee and snacks, and thus also reduced staff interaction. This lack of interaction reduced knowledge-sharing also and thus the feeling of 'us' in the organisation (The Lecturer 2001). Senior management were operating under the belief that one of the major drivers of the re-organisations was the desire to break-up power cliques and thus they often found themselves outside the circle of consultation and only the recipients of hearsay (The Lecturer/Researcher 2000). Senior management had been replaced; major changes in work practices had been put in place as well as new demands on the labour force during these periods. There was little involvement in consultation for the re-organisations – they were seen as 'diktats' by staff (The SRS Data Team Manager 1997). It was understood that the VC took advice from consultants about the re-organisation but that even the senior management were not fully consulted or informed (The Director of Registry Services 1997). Some form of consultation was practised but staff felt that it was 'in name only' and that the VC would not take advice (The Lecturer/ITAG Member 2001). In addition, it was widely believed by staff that the VC was not following the advice of the consultants retained to advise on the re-organisation process but was acting on his own initiative – there was a fairly widely held belief in a conspiracy theory (The Lecturer 2001).

5.2.2.1 Information Fitness

It was clearly understood by the university that there were issues in relation to information needs and IT strategy so in 1994 an Awayday was held under the auspices of DA who was then Director of Corporate Strategy and AR the Commercial Director of the company in charge of the IT support (UD15 1994). Invited to this Awayday were interested members of staff from both the academic and administrative fields. The staff that attended were divided into syndicate groups to discuss and later investigate the priority areas identified.

Five areas were identified as having priority and needing development, these being:

Student records;

Financial information;

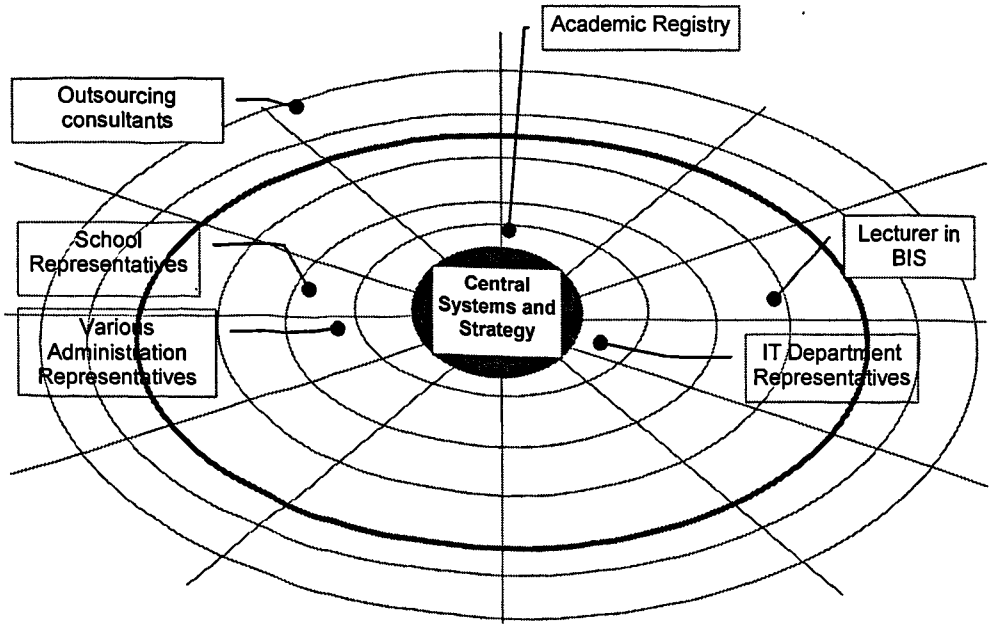
Learning needs;

Communications;

Staffing information.

Each area was considered in terms of future requirements as well as current actions with a project sponsor identified for the future work. Each priority area was considered by a syndicate group consisting of a mixture of academic staff identified from the Information Technology Advice Group (ITAG) membership and related administrative staff - see Figure 5.4. The ITAG being a group made up of members nominated by middle management for their interest and background in the topic of IS/IT strategy that in 1994 had 12 members from six constituent areas.

Figure 5.4 Constitution of ITAG 1994



The syndicate groups held their initial meetings as part of the Awayday but further meetings were held and reports were fed back to DA in due course and were incorporated into the report UD15 (1994) and which later fed into the 1995 series of reports.

The Student Records Syndicate identified the need to integrate the F* system (which the VC had brought to the university) with student records as a substitute for the current timetabling system - which had been created by a member of the academic staff some years earlier on a spreadsheet and was experiencing some difficulties. It was believed that this would enable students to register directly for modules and seminars with an automatic allocation of time slot and room. Two other major issues considered were the need to integrate the library system so that student data need not be entered separately, and to upgrade the Student Record System (SRS) from the Further Education Management Information System (FEMIS) to Higher Education Management Information System (HEMIS) (note these are bought as package systems from a central software supplier) (UD15 1994). This latter did not happen during the 1994/5 academic year as it was felt necessary to incorporate all the recent changes in organisation before the SRS was adjusted. AD - the Academic Registrar and Chair of the Administrative Management Group was appointed project sponsor for the future development of the SRS.

The Financial Information Syndicate considered a number of issues including ensuring that current manual procedures were automated; additional checks (manual and automated) to reduce errors; the production of further management reports; and the linkage with the payroll system, which was currently not satisfactory. The Director of Finance was appointed as project sponsor (UD15 1994).

The Learning Needs Syndicate considered the issues relating to the intended move towards to resource-based teaching and learning based around the LRCs (the first phase of building being complete). This included the upgrading of the Library system and the physical and technological infrastructure and the future framework for the development of the information resources. PD, Head of Library and Information Services was appointed project sponsor (UD15 1994).

The Communications syndicate pressed for adoption of a university-wide email system hosted on PCs as well as connection to external networks such as the Internet. They also considered the use of voice-mail. MO, the Head of School of Business was appointed project sponsor (UD15 1994).

The final area, that of staffing information, was one that they considered had received very little attention during 1993-4 and before. It was believed that the data held on the current central system was not trustworthy and therefore not reliable and that the data should be able to be accessed more directly by Schools and Services. The Director of Personnel was appointed project manager (UD15 1994).

The role of project sponsors was identified to include collecting a group of stakeholders from staff and where appropriate, students, estimating benefits of identified sub-projects and proposing the timescale and outline project plan. The intention was that these proposals should be reported back to ITAG, by June/July 1994. Alongside this activity a draft strategic data model was being developed by the report authors to ensure consistency in data standards across systems and databases. The reports from the project sponsors were considered in July 1994 and the resulting report passed to the VC for circulation to the Governors and senior management in order that information and IT strategy could be considered within the overall strategic plan (UTR1 1994).

The student records group expressed concern about the integrity of records (a concern that was to be repeated time and again over the subsequent years and that was to cause a major issue in the year 1997); and recommended that a review of whether FEMIS was the appropriate student record system should be conducted (UTR1 1994).

The issue of lack of trust in data was again mentioned by the Financial Information Syndicate, and had resulted in a proliferation of local systems, which meant a duplication of records. A suggestion was made that there should be wider ownership of financial decisions and strategic decision-making (UTR1 1994).

In the July 1994 (UTR1) report it was emphasised that student records and financial systems were support systems and that, as such, less emphasis should be placed on them than on teaching and learning resources. The library system in particular was identified

as in need of replacement, which would cost a large sum of money against the declining funds available from student intake. (This financing reduction was due to the reduced level of funding from the Government. UofB was almost completely reliant on government funding and money earned from its NHS contracts - it did not have reserves and did not attract research funding, as described above in the Landscape.) In addition, it was already known that the unit of resource would diminish over the two upcoming years and therefore a further squeeze on UofB's financial base could be expected.

The report and the comments expressed by the report authors (DA and AR) emphasised the necessity for an IT strategy based an overall corporate strategy to facilitate the project prioritisation. As a result, in early 1995 a proposal for the future management and control of IS and IT at the university, was put forward by the Director of Commercial Development – who was later to become the Pro-VC for Commercial Development – and who held the overall responsibility for IT/IS in the university. In this report (UTR2 1995) it outlined the way that planning and strategy should be developed for IT/IS at the university. The ITAG was to report to the IS/IT Strategy Group – known as the Communications and IT Steering Group (C&ITSG) and yet to be created (UTR3 1995), and was to be held responsible for the implementation of any decisions made at the Steering Committee. In addition, ITAG was to be supported and advised by two sub-groups – the Software Advisory Group and the Academic and Student User Group. The C&ITSG was to decide and prioritise the immediate needs for IT investment and evolve areas for new initiatives. It reported that the C&ITSG was to be comprised of members of the most important stakeholder groups, but these representatives were not identified. Finance for any projects decided was to come (unless within a limited budget devolved) from the Finance Committee and thus this top-level committee had the final say in project allocations. Computer Services had responsibility for implementing, integrating, operating and supporting applications and infrastructure and internal budget managers (such as Head of Schools) could bid for funds to spend on applications, hardware or software on an individual basis without reference to any overall plan. It was noted that the only expenditure that currently went through a full consideration of its impact was that of the existing outsourcing. The report containing this proposal (UTR2 1995) was circulated to Heads of Schools and Services as well as the Directorate for comment.

Some Schools circulated the report to lower members of staff for comment but no meetings were organised centrally for consultation.

In Mar 1995, the final revision of the Management and Control of IT/IS Report was circulated (UTR3), in it priority study projects were identified. The major ones being the development towards an integrated MIS with links to FEMIS/HEMIS and F*; and the development of an electronic campus (p4). F* was the software application that had been introduced to the university by the VC at the time of his arrival. It had been implemented in his former organisation and he thought it would prove useful for UofB.

The final report noted that:

> "If projects are to be successfully selected and implemented and services provided, then it is essential that all concerned understand the basis of decision-making and the processes involved." (p9 para 5.1 1).

It was not clear to many at UofB at this time however, how the decisions were taken and retrospective views seemed not to enlighten the process (The Lecturer/Researcher 2000).

The report also noted that the concept of profit centre / cost centre budgeting, although applied to other types of expenditure in the university, had not been applied to IT/IS expenditure and that this impacted on the revenue stream that projects required over their lifecycle.

5.2.2.2 The New Learning Environment

One of the outcomes of the need to increase the resource base for teaching and learning in order to cut costs was the decision to re-engineer the university into a new learning environment.

The third re-organisation was proposed in 1995 as the New Learning Environment. It was intended to offer 'a radical and imaginative response to the future of higher education in the UK' with an underpinning approach of being pulled by the future rather than pushed by the past (UD22 1995). The NLE as it came to be known, was designed to improve the quality of the student experience by:

Providing a more structured teaching and learning environment

Providing more individual support

Providing access to a wider range of learning resources

Providing more flexibility in how, when and where learning takes place

Encouraging students to play an active role in their learning (UD23 1997).

The New Learning Environment (NLE) came into operation for the first time for the intake of 1997/8 and was a radical re-structuring of degree programmes and the student experience. The conception of such a new learning environment came about as a response to the funding constraints imposed on universities in the autumn of 1994 and before, and also in anticipation of the future. It became clear that finances were not likely to support the existing level of student/staff ratios and the staff/student contact hours (UD22 1995). It was felt that there was a need to review the programme structure and improve the quality of the student experience (UD24 1997). Staff were unconvinced about the NLE. It seemed clear to them (The Lecturer 2001) that what was really meant was that there would be cuts in all directions of teaching. The NLE meant larger classes, fewer taught hours, fewer modules taken and reduced assessment loads and sizes. Whilst it was accepted that this was a necessity for the health of the university's finances, the 'spin' of the NLE as being innovative rather cost saving was not appreciated. In addition, staff noted that prior to the introduction of the NLE, all audits and quality inspections had found satisfactory both the programme structure and the student experience and thus the quality of the experience needed little improvement (The Lecturer 2001).

A number of working groups had been established to discuss programme provision as well technology development. A Strategic Planning Team had been established to oversee the production of the plan in line with the Guiding Principles that had been established (see below).

The NLE was conceived of as being a partnership between those undertaking the process of learning and those involved in supporting this process. It was thought of as being 'active learning'. This approach seeks to measure the contribution of the learner to the

process as well as to establish the effectiveness of the process; student responsibility was therefore to be enabled and encouraged. It was believed that there was a continuing need to increase participation (which the university had already showed a great deal of success in so doing); to provide a flexibility of provision for students studying at a variety of levels and across a variety of modes.

Critical to the success of the NLE was a sufficient and quality supply of technology-based learning resources and thus the Learning Resource Centres already established at the two campuses were central to the plan as electronic learning hubs. Technology had already proved to be an issue with the university for many years and as such had been the subject of various actions to reduce the need to manage it internally and to fund it through direct purchases. In 1995 a major report on the management and control of IS and IT was written by the ITAG – to:

> "...define, and identify, where they already exist, a framework of principles, policies and standards to direct the provision of Information Systems (IS) services and the Information Technology (IT) to support them." (UTR6a).

The report of 1995 (UTR6) also published an IT Strategy Road Map and annual programme of work declaring that:

> "The IT/IS provision should support UofB's aims and objectives in a cost-effective and secure manner." (UTR6a 1995).

It was understood that computing provision was in competition with other demands for finance and the whole university life issue of financing was necessary to consider in order that consistent plans and selection criteria were being utilised across projects. An additional problem that the ITAG saw was the 'fashionable nature' of the marketplace, which would inevitably lead to demands from the academic establishment for the latest products to support the academic mission in a competitive marketplace (UTR6b 1995). An example of this being the development of multi-media programmes, which required highly specialised equipment, largely at the expense of generic IT provision. The programme attracted large numbers of students and thus the equipment was not available for use by other students, who were accordingly left with much poorer IT provision.

AW the Pro-Vice Chancellor for Commercial Development chaired the ITAG. A group of consultants – I* – had been employed by the VC to report to the ITAG, to produce proposals for the network infrastructure and development and their proposals were fed into the final report published. In due course the issues they raised in their report (lack of overall authority, inconsistent configurations, split responsibilities, lack of tools etc (UTR17 1995) led to another company (II*) being employed as an outsourced contractor to manage the academic computing under the NLE.

In 1994, after the second (organisational) re-organisation and before the third, a seminar was held, under the auspices of the ITAG, to consider the organisational IT/IS Strategy requirements. A number of issues were identified by the specified Syndicate Groups for Student Records, Financial Information, Learning Needs, Communication and Staffing Information (see above), which were later taken into consideration by the ITAG when their report of 1995 was drafted (UTR3). It was noted that no feedback or acknowledgement of submissions, were circulated to members of these Syndicate Groups (The Lecturer 2001) – whose constituency of members remained the same throughout the period despite the organisational changes (The Lecturer & ITAG Member 2001). In addition, although a number of information requirements were identified at this seminar, no formal information strategy was ever developed and no further such seminars were held. In fact it was later noted (JASb 2000) that the Hefce auditor recommended an updated information strategy and development plan as there were concerns relating to the outsourcing contract relating to the implementation of the NLE.

The priorities as identified by the ITAG in 1995 (UTR3) were the development of an integrated MIS which linked to the SRS plus other systems; a review of network management and development requirements for the electronic campus and an annual cycle of reviews for academic requirements of a specialist nature. Two major studies were proposed. The first was work on the existing MIS and its integration into other systems. The second concerned the need for the network infrastructure to be put on a sound basis for the proposed electronic campuses for the NLE.

The Information Systems Department (ISD) thus worked hard for some months on investigating how a new system, which they understood was to integrate a number of

systems (including system F*, see Section 5.2.2.1 above) into a central suite, could be developed and what the requirements would be, including work on a proposed timetabling system to replace the existing one. They spent considerable time on analysis and user consultation. The system was 'sold' to staff and students as being designed to allow students to examine details of modules, make choices and be issued with a confirmed timetable. It not only did not perform these tasks when implemented in 1997, but also did not provide the basic necessary data on modules. When the VC found out about this (in 1997) he commented "Oh...F* (system) ... that's just a piece of software I brought from C. It was never meant to do anything or integrate anything" (RW 1998b). Thus we find a mismatch between the internal view of the integration possibilities and strategy and the reality of the possibilities and the 'real' IT/IS strategy of the organisation.

An IS/IT Strategy Committee had thus been proposed to control the priority and work programme in accordance with the university's principles. A structure for decision-making had in the view of the university been established. The next stage envisioned by the ITAG was:

> "... a form of prioritisation to ensure that out of the portfolio of potentially beneficial projects and services identified – priorities are assigned to those which are most beneficial to UofB and that implementation takes place in a controlled manner..." (UTR6c 1995).

5.2.2.3 Pause for Thought

Finalised in May 1996, the proposals for the NLE became the driver of organisational change as existing academic and administrative structures were inadequate to deal with the new environment.

The new organisational structure was developed (UD25 1997) according to nine principles:

1. The structure should be simple to operate;
2. The structure should facilitate effective teaching and learning;
3. There should be scope for further development to meet changing needs;
4. The organisational framework should be derived from and driven by the NLE;
5. The organisation should be driven by the requirements of teaching and learning;
6. The organisation should encourage innovation and new developments;
7. The organisation should support effective communication and administration;
8. The organisation should be efficient, cost and time effective;
9. The organisation and its structure should facilitate diversity across the university.

The new organisation now had four Colleges and five Schools. Under the VC were appointed two Pro-Vice Chancellors – one for Academic matters and one for Developmental matters.

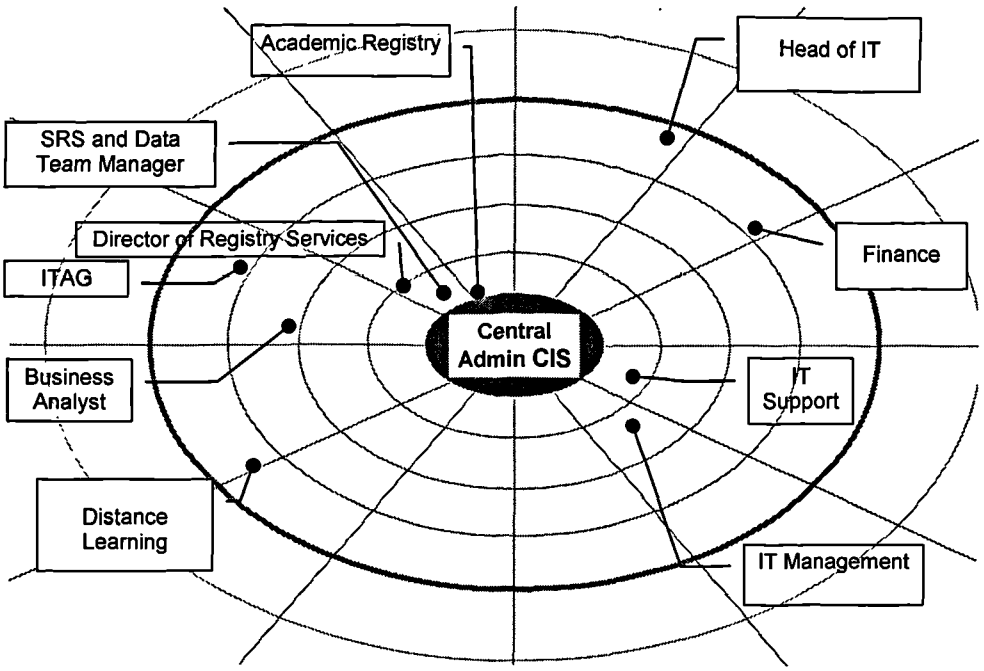
It was implicit in the NLE re-organisation of teaching that the new technology would be utilised to support teaching and a report was commissioned from JC (UTR7 1996) on Computer Supported Teaching and Learning and to investigate how best the technology could be put to work. In particular the report investigated the use of Computer Supported Co-operative Work (CSCW) and the use of the Internet for teaching and learning. The report concluded that there were teaching, financial and marketing benefits to be gained from the application of such technology and recommended the implementation of a pilot study. The report emphasised the necessity of funding such a pilot programme at both the development and project management level although over the life of such a project the savings would be considerable once up-front costs had been amortised. This project was never undertaken.

Planned for 1997 was a new management information project as an initiative of the VC. Senior management and directors were to look at what management information was required, how it was obtained and what should be the role of existing systems (The Finance Director 1997). There were concerns that the existing MIS was not good at pulling out information and was not robust in data entry and that as the NLE came into

being this would become of greater concern (The Finance Director, The Director of Registry Services, The Business Analyst, The ISD Project Manager 1997). It was however, obvious that despite the talk about strategic planning of systems and many investigations into possibilities, the finance had not been allocated in any serious manner and the priority to undertake this work was not high (The Pro-VC 1997).

In late 1996 the plans for the new MIS resulted in a meeting of interested parties to discuss the possibilities arising from integrating the current SRS and other existing system as well as proposed new systems. This meeting called by the Head of IT and chaired by the Head of Academic Registry brought together stakeholders from the Registry, IT, the ITAG and relevant administrative departments (see Figure 5.5 below). The discussion (UD30 1996) considered the needs of the NLE and the resulting changing internal requirements, and the potentials that existed with enhancements of the current systems or the possibilities with the purchase of new systems. It considered that up until then there had been a process of 'organic' development for systems within the university. They identified a list of 'needs', 'wants' and 'wishes' for an enhanced system over the next couple of years to fulfil the restructuring requirements and to provide the necessary information for external stakeholders such as the Further Education Funding Council, the Law Society and other professional bodies, auditors etc. A suggestion was made that an investigation into what other universities did in terms of a central MIS was undertaken including an investigation of the outcomes of the government sponsored MAC initiative. The Director of Registry Services did in fact undertake this comparison and returned convinced that the current SRS with its attendant systems and necessary improvements was the better route to choose for the university (The Director Of Registry Services 1997).

Figure 5.5 Membership of SRS Potential Committee



This 'steering' group did not meet again but the IT Strategy group continued to meet. This group had been set up by the Pro-VC for Commercial Development who was also Head of University IT. *Membership of the group was by invitation and was comprised* of senior managers of academic and administrative departments. This group 'regularly liaised' with Registry (SRS and Data Team Leader 1997). In early 1997 the IT Strategy Group brought out a *document containing the Strategy for the Development*, Management and Control of IS and IT for the university. This group had the remit to:

Develop and maintain IS/IT Strategy;

To hold the central IT budget and recommend expenditure on the basis of requests from heads of units;

To assure that all expenditure is in agreement with the principles set out in the strategy.

It reported to the IT Board that comprised the two Pro-VCs and the Finance Director.

The board had the remit to:

Review and agree the IS/IT Strategy and ensure that this was synchronised with the overall university strategy, mission and vision;

To recommend overall IT/IS budgets;

To directly authorise expenditure on large projects (UTR5 1997 p12).

Late in 1997 both Pro-VCs were still concerned about the information that the central administrative system was providing and the accuracy of the data that was input – the Pro VC for Commercial Development felt that it was not a system issue but:

> "Very much a process issue that is very much involved with the people and the work they do, the management and the decisions that are made, and the understanding together all of us what needs to be done to make sure that we do have an accurate and well managed and well flowing system." (AW 1997).

The other Pro-VC in contrast felt very strongly that it was the incremental nature of system development around the SRS and the central suite that had led to difficulties:

> "I think that there are real difficulties in some sort of .... because we've taken this relatively low cost investment strategy, various difficulties have accrued as a result of this." (SHa 1997).

> "We're effectively limping along with a system which makes it very difficult for a whole set of people in the university to do their jobs." (SHb 1997).

5.2.3 Teetering on the Brink

> "Let it be noted that there is no more delicate matter to take in hand, nor more dangerous to conduct, nor more doubtful in its success, than to set up as a leader in the introduction of changes. For he who innovates will have for his enemies all those who are well off under the existing order, and only lukewarm supporters in those who might be better off under the new." (Machiavelli, 1513).

To support the NLE a number of new or revised computer information systems and supporting technology were required. The NLE was intended to be technology intensive and many of the re-organisations and job re-allocations and reductions were made in the belief that new Computer Information Systems would replace their position functionality.

In the event this was not to be – especially at the crucial time of the start of the 1997 academic year.

A university strategic plan was devised and distributed to staff early in 1997 to underpin the direction in which the VC saw the university heading. The plan was to last for five years and identified five key drivers for the institution. These were as shown in Table 5.1.

Table 5.1 Key Drivers for UofB (UD25 1997)

1.	To build up a reputation for excellence in teaching and learning underpinned by scholarship
2.	To be at the forefront of the harnessing of technologies and the commercialisation of activities to support teaching and learning, enabling education to be freed from time and space constraints
3.	To continue to improve the quality of educational programmes and the student experience
4.	To develop more partnerships and collaborative arrangements with public, voluntary and private sectors, in the UK, Europe and internationally
5.	To consolidate and improve the university's financial position.

In addition eleven guiding principles were also identified that were intended to enable the university to fulfil its mission. These were as shown in Table 5.2.

Table 5.2 The Guiding Principles for UofB (UD25 1997)

1.	To be student driven
2.	To aim for growth in and with the university
3.	To establish strategic alliances and partnerships with employers, further education and higher education providers at home and abroad
4.	To widen and increase participation
5.	To move systematically towards active learning and the harnessing of technologies to support teaching and learning
6.	To value scholarship
7.	To provide mixed mode study opportunities for all students
8.	To offer a wide range of high quality student services
9.	To demonstrate the practical results of a commitment to the equality of opportunity
10.	To increase the proportion of the budget spent directly on teaching and learning
11.	To support cultural development and activities within the region.

Staff were at the time demoralised and stressed from trying to cope with the massive set of changes that had been happening for the past few years and whilst these principles and drivers were clearly laudable, staff felt unable to take these statements as anything other than just that, statements - without either action or meaning (The Lecturer 2001, the Lecturer/Researcher 2000). Such was the stress of trying to complete the programme re-validation in time for the start of the academic year 1997/8 that it later became clear that a number of shortcuts in the process of validation had taken place (The Lecturer / ITAG Member 2001). The QAA report to come indicated this clearly.

Supporting the overall Strategic Plan was a Strategy for the Development, Management and Control of Information Systems and Information Technology (UTR5 1997). In this IS/IT Strategy document were discussions relating to three initiatives that were taking

"We have the technological infrastructure - now we must invest time and money in staff development, the curriculum and quality learning material." (UD26b 1997).

Unfortunately, as emphasised above, administrative systems were low in the order of priorities, as were staff concerns relating to their working conditions, and these were two issues that went on to cause major difficulties as described below.

5.2.3.1 The Brink

Supporting the new Strategic Plan was a proposal to change the working contract of Academic staff which was not agreed to by staff or unions at this time, and was a subject of dispute to add to previous academic staff grievances. As reported in the university newsletter (UD24 1997) the proposals for the change in lecturer's contracts was aimed at cost saving, it would cut overtime payments dramatically and negotiations on this new contract had begun in May 1996. No solution was found quickly and by Jan 1997 the dispute (despite the intervention by ACAS) had escalated to the extent that union members were refusing to grade assessments of any type. In addition union members were refusing to participate in planning and preparation for the introduction of the NLE and were not developing module and study guides for the coming academic year (1997/8). It was proposed that external or fractional staff would mark assessments so that students could progress satisfactorily but in the event this did not happen. Assessments continued to be unmarked for a considerable length of time. It was not until May 16th 1997 that the dispute was finally resolved and then began a process of 'catch-up' with the backlog of assessments and checking that data on pass marks etc were correct. This backlog had not been cleared fully by the time the summer examinations and examination boards had been completed and thus it was not certain which students had to attempt resits or were ready to progress onto their next year of study. This would cause issues later in the summer as described below.

The major re-organisations had additionally a side effect not initially realised but one that later caused severe problems for the organisation. This was the loss of tacit knowledge particularly in the administrative staff. Administrative staff were considered non-specialist and interchangeable and thus the re-organisations lost the informal information systems structures that were derived from the embedded knowledge of the workers.

During the period 1997 to 1999 administrative functions had been changed from centralised in early 1997, decentralised in 1997 for the introduction of the NLE and then centralised again in 1998/9 as a result of the crisis that occurred in 1997/8. BPR (Business Process Re-engineering) had also taken place more than once and further jobs had been lost over this two-year period.

It thus came to light as the NLE came into being that a number of the administrative functions that had been re-engineered out of existence were in fact necessary and vital to the organisation's smooth running. The jobs were thus recreated (The SRS and Data Team Manager 1998). These jobs were in many cases in the area of data validation and entry. About this time too, staff unrest and disaffection became more apparent in the posting of various notes around the university (The Lecturer 2001) – these included quotes such as:

> "In Germany, the Nazis came for the Communists and I didn't speak up because I was not a Communist. Then they came for the Jews, and I didn't speak up because I was not a Jew. Then they came for the trade unionists and I didn't speak up because I was not a trade unionist. Then they came for the Catholics and I was Protestant so I didn't speak up. Then they came for me .. By that time there was no one to speak up for anyone." (Niemöller 1968).
>
> "We trained hard ... but it seemed that every time we were beginning to form up into teams we would be reorganised. I was to learn later in life that we tend to meet any new situation by reorganising; and what a wonderful method it can be for creating the illusion of progress while producing confusion, inefficiency and demoralisation." (Petronius Arbiter d AD65).

These notes and their prominent positioning within the university buildings would seem to be an indication of the high level of unrest that had become apparent during the years 1997-9.

5.2.3.2 The SRS

A particular problem during all this period was the Student Record System (SRS). A student record system is crucial to a university as it contains the data on which the funding of the university is based. From the reports produced by a SRS the HESA

statistics are derived and the Government allocates funding according to full-time equivalent (FTE) status of students. Each mode of attendance that a student can undertake is allocated a FTE multiplier from 1 for a full-time student to 0.1 for a part-time evening only student. Thus it is extremely important that not only does the SRS accurately record how many students are attending the university but also by which mode they attend.

As discussed in previous sections of the organisational story, the data input into the SRS was regarded with a great deal of suspicion by a number of academic and administrative staff. Concerns over data quality had beset the university for many years. These concerns were to be brought to the fore in the crisis year of 1997. It was evident that accurate data input and output was essential for not only the successful internal running of the university but also for the supply of accurate information to external bodies for financial probity and to obtain the necessary finances.

5.2.3.3 Related Administrative Systems

As the academic year started there was a crisis in the information systems used to run the timetabling for students, rooms and staff. The software, which had been externally purchased due to the collapse of the F* initiative, had not been intended by the creators of that software to be used for that purpose. Moreover, it was originally due to be delivered in November 1996 but did not arrive until August 1997. The software was therefore not only un-piloted but also unknown as to its potential and capabilities as it had not yet been developed into what was required. The people who were charged with using the software and collecting the necessary data were, at this time, only "able to make a guess as to what it would finally do and how it would perform" (SW 1998). In addition, the administrative staff that were charged with collecting this data in early 1997 , were "hacked off". They "also were not always likely to be in post in the NLE and they knew it so they had no responsibility other than their professional responsibility" (RWb 1998). A number of additional problems were also identified in the way the timetable had been created which meant that many students did not receive their personal timetable until after several weeks of term had passed (UD4 1997).

The 'new' information system that thus was being used was not, in fact, the intended centralised system but one that was being used in parallel. Two teams were working on the data and inputting it separately to two different systems. The staff were making errors, partly because of multiple data entries being made in parallel systems but also because, due to the re-organisation and loss of staff, untrained staff were being used for data entry.

The IS implemented for student registration in the autumn of 1997 included a Smart card system – whereby one registration at the start of the academic year put the student into their a) course, b) gave library registration, c) access to the LRCs, and d) timetabled their modules on an individual basis. Not fully tested in its integration the system failed to operate in the way intended. In particular, the timetable element failed completely for 1997/8 academic year entry and a backup system was used which still did not work satisfactorily as it was dealing with an unknown quantity – the data was incorrect, it was insufficient, supplied too late, and incompatible with the options available on the system. For example, students could choose a module from many different routes and thus needed many different schedules in order to prevent timetable clashes but often there were limited staff availabilities for this module and thus the student requirements and the lecturers' clashed (SW 1998). Lack of consultation in the timetable structuring meant that staff running the timetabling procedures were not fully aware of all the complexities and possibilities and had had no input into potential issues that their knowledge and experience would have warned them of (RW 1998). There was also a lack of consultation with academic staff relating to timetabling events – for example the Undergraduate College decided to extend the teaching day to 9am – 9pm Monday to Friday without consulting academic staff. The computer system then proceeded to schedule classes for lecturers from 9am in the morning to 9pm at night without breaks i.e. some staff were scheduled for 12 hours teaching in a one day period (The Lecturer / ITAG member 2001). In the event of this becoming known, academic staff refused to teach Friday evenings and could not be expected to teach more than 2 evenings per week, thus meaning that evening scheduled events had to be re-scheduled and other classes shifted to permit a more reasonable teaching schedule for staff.

In addition, the systems designed for the NLE with the aim of making the student self-taught were not fully developed or implemented. An example of this was the Student Profiling system, which had been bought and given to staff for testing to run alongside the Director of Studies (DOS) scheme. The intention was to allocate each student, on his or her arrival at the university, a DOS. This person would then guide them through their university career through means of both personal tutoring and also special study and careers skills workshops that would be run on a regular basis. The intention behind the scheme was to try and minimise student dropout from the university. This software had been intended for student use to input details as they progressed through their studies of work-life skills in order to create a portfolio for future work. The staff concerned wanted to pilot it for a semester before live running but the VC overruled them. It had to go live at the start of the academic year. The senior management responsible for overseeing the implementation of the software were 'frightened' to tell the VC that the software was not fully tested and may not be suitable for the purpose. In the event the system was tested by staff but failed to operate correctly within timescale set for implementation (The Lecturer 2001).

The staff disaffection (see above) had also meant that work towards the development of modules into computer and distance learning workbook 'capable' had not proceeded according to plan. Most modules in the university were little changed and this meant that Project Hercules, which was the development of these systems into a form where they could be sold onto other institutions, was not able to be realised (the Lecturer/ITAG member 1997). It should be noted that the concept of Project Hercules was not new or unique to UofB. UofB had in fact commissioned a report (UTR7 1996) see above, which investigated the background and existing projects in this area of CMC for student teaching and learning. This report highlighted the work already being done as such places as Lancaster and Kent universities. It should be noted that this report also highlighted the issue that course and modularity schemes were not necessarily interchangeable between universities and thus the concept may have been flawed for external sale purposes whilst remaining useful internally.

It now appeared that UofB's new high technology NLE "held up by the government as a model for the future of HE" was in chaos because of timetabling issues. The 'Big Bang'

approach to implementing new technology had strained the system and organisation and resources were put under pressure (Tysome 1997).

So great were the difficulties being experienced during late 1997 that senior management prepared a report for Governors. Leaked to the Press (Thomson 1997) the report characterised UofB as an institution "beset by staff and management antipathy, organisational chaos and fears over academic standards". There was a culture of fire fighting through crises with no long-term strategic plan. This report was the result of senior managers being 'sent out' to canvass academic and administrative staff's views of the issues and to draw up a framework for an action plan to respond to perceived difficulties (UD7a 1997). Thirty-six meetings were held within a two-week period in October of that year. In addition meetings were held with Trade Union representatives and the senior management group and registry services managers. Memos and emails also moved around the organisation and were used for consultation. This report on the new ways of working (UD7a 1997) identified the context of change and the problems caused by the 'big bang' approach of implementing both the NLE and the academic related re-organisation. These issues were classified into twelve themes relating to: Communication; Organisation and Culture; Staff Relations; Centralisation; the Student Life Cycle; the Physical Infrastructure; the Director of Studies scheme; Quality, Professionalism and the Curriculum; the Institute of Health; the Outer London campus; the Library and Learning Resources and Information Technology.

Information technology was still proving to be a problem for the university. In particular there was felt to be a lack of technical stability with in many cases inadequate support and problem solving capabilities. Systems were often considered outdated or inadequate and the data used for the central administrative system and SRS was felt to be inadequate and or inaccurate (UD6 1997, UD7a 1997).

UofB had reached its crisis point. Staff morale was desperately low. In the belief of some members of staff, as witness the memo sent to the Board of Governors in Oct 1997, it was said that UofB was:

> "... effectively a dictatorship ... there is no participation, no consultation and no negotiation." (UD3 1997).

Staff urged the Board of Governors to either exert more control over the VC or to remove him from post. The levels of management had multiplied during this period of crisis and the structures of the organisation had become more complicated – an increase in the bureaucratic form.

The university thus invited the QAA to investigate matters related to quality and standards.

5.2.4 Deformation and the New Landscape

In their report in late November 1997 to the Board of Governors, the QAA indicated a number of contributory factors to the crisis situation at UofB (UD8 1997). In particular they highlighted the long-running industrial problems and the resulting issues with data collection and processing leading to the problems over student progression for the academic year 1997/8. Furthermore they highlighted the problems with the administrative structures of the university. Whilst the QAA was cognizant of the fact that some staff were extremely vociferous in their dislike for the VC they nonetheless conceded that normal staff-management communication and relations had broken down. They acknowledged that much of the evidence was anecdotal regarding the breakdown of systems stemming from the re-centralisation of functions as part of the NLE re-organisation, yet they could not fault the allegation that the examination/assessment system broke down in 1997. The VC had decided to continue with examination boards despite the realisation that they would be operating with incomplete data and therefore that the decisions they were making could not always be fully justified by factual evidence. This meant that some students were wrongly informed they needed to resit, whilst others were not told at all. The examination resits took place despite the lack of organisation and the subsequent 'need' to ameliorate the marks as authorised by the Pro-VC (UD8 1997).

As a result of the meetings with staff and the QAA report a team had been appointed to check data quality and an action plan had been published. The QAA expressed its dismay that many internal measures had been 'leaked' to the press because this indicated the amount of staff disaffection within the university. The outcome being that that the QAA

recommended that they be invited to conduct a full review of the academic systems and that the university should carry out an internal review of the systems and staffing of central administrative. The Board of Governors accordingly asked the QAA to carry out its full audit and set in motion the necessary internal measures whilst still emphasising their support for the existing VC.

1998 did not prove to be a much less troubling year for UofB. Teaching at the university continued under the auspices of the NLE and a number of initiatives were put in place to alleviate the worst of the administrative problems and data quality issues. There was a significant drop in applications leading to a projected income shortfall of £4.3 million (UD16 1998) and it was announced that in the revised funding allocations for 1998-9 (Higher 1998b) – UofB was awarded no additional student places, a reflection of the Government's belief that it a) would not be able to attract additional students, and b) would not be able to cope with more. The Sunday Times survey in 1998 in fact placed UofB in the 'worst 5 universities in the UK' category.

The QAA carried out their audit in May and June 1998 according to the agreement made in Feb 1998 as to areas for scrutiny. The QAA in their second report to the Governors of UofB, published in late 1998, acknowledged the 'impressive and frank account' of the situation within the organisation given by senior management and other consulted members of staff, to the QAA investigators, which included a number of suggestions for action (UTR12a 1998). However they also acknowledged that many staff thought that the consultation exercises being undertaken were 'cosmetic'. At the time of completing their report the action plan devised by the university as the result of the first QAA report, had not been fully implemented and so the QAA could not confirm its assurances on the quality and standards of UofB's academic activities and therefore recommended external assistance in monitoring progress. They were concerned about the continuous change in structure and form since 1992 and the introduction of a new academic programme at the same time as the university re-organised the administrative functions. In their words, as might have been anticipated, this subjected the institution, its staff and its systems, to stresses which it was 'not able to bear' (UTR12b 1998). The outcome had been a serious breakdown in trust between staff and management. A culture of blame had arisen, many staff overtly hostile and disaffected with a series of confrontational industrial relations

occurrences. (Although there had been an initial resumption of work in 1997 the dispute was not considered completely settled by the unions and was still simmering in the background throughout 1998.) In fact the QAA commented that the VC, in his personal evidence to them, remained unable to manage the misconduct and poor performance of some academic staff:

> "Those disaffected with management and its style could not be dismissed simply as a small hard core of trouble makers. The review team listened to complaints of conflicting directives, rapid and unexplained policy changes, procedural confusion and lack of trust." (MacLeod 1998).

As Natfhe pointed out (HE News 1998) academic staff need to feel closely involved in policies and procedures for success and need to be fully involved in debates about strategy. An action plan was therefore suggested with a full institutional review to be carried out in 2001-2.

The immediate result of the publication of the QAA report was the resignation of the VC with a 'holding' committee consisting of an acting VC (WT - appointed until September 1999), a member of the university auditors and the new Deputy VC and new Pro-VC for Resources and Operations (to join the university in early 2000), appointed to undertake the production of the Action Plan (UD14 1998). It is noteworthy that these posts had been vacant for some time under the outgoing VC, as he seemed to feel they were unnecessary to the management of the university, the pro-VC for Academic Affairs having resigned her post immediately after the examination board crisis of 1997. As an act of goodwill the union immediately suspended their move to ballot on further industrial action, which was planned (UD17 1998) and agreed to seek an early meeting to resolve the outstanding issues. The new acting VC immediately set out to meet with all staff through a series of meetings across all schools and both campuses, to discuss the issues and draft the necessary action plan. It is worth noting here, that in a radio interview (Higher 1999a) MF, the 'old' VC of UofB said that the previous staff unrest "had little to do with his management style and everything to do with academics' well-known selfishness." In contrast to this an editorial of the Higher in 1998(c) commenting on the situation within the UofB said (witness Machiavelli's comment above):

"Generally, radical change cannot be imposed top-down in public or quasi public sector organisations.... without the active involvement of a large part of the staff, those who dislike the changes being proposed ... will always be able to obstruct them."

5.2.5 Searching for a New Fitness

The Action Plan, due for completion by March 1999 was to consider not only the financial and other implications of the student recruitment shortfall but also any issues relating to the current organisational arrangements and possible changes that may be desirable. It was also to consider the scope for collaboration with other institutions (UD18 1998). Importantly the newly appointed acting VC took the lesson learnt about consultation to heart and all staff were to receive copies of the new strategic plan plus open meetings for staff and students were held during Feb 1999 (UD20 1999).

The estimated shortfall for the academic year 1999/2000 was estimated to be £8 million and whilst Hefce initially offered help with 'restructuring' it showed little inclination to assist with the increasing financial problems of UofB (UD27 1998) even though it wanted a return to financial viability as soon as possible (Hefce 1998). In a memo from the VC (UD21 1999) it was made clear that one means of dealing with the financial issue was to take 'advantage of all vacancies that occur by normal resignation or retirement'. In fact during the period from August 1999 to December 2000 UofB lost more than 60 non-academic staff with an accumulated total of over 300 years experience of working for the organisation. This was in addition to academic staff, who left through early retirement deals or to take alternative positions. The plan indicated that over 90 academic jobs were to fall vacant through either non-replacement of leavers or redundancy. In reality many more left than this as many academic staff did not wait for redundancy but moved on to industry or other institutions as soon as they could.

The plan was duly submitted to Hefc and approved. The plan included not only restructuring of the academic provision but also improved management information to track student progress and financial management. The Action Plan (UD13a 1999) noted that there had been a significant time lag for the IS underpinning the registry functions to catch up with institutional change. During this period the SRS had migrated from FEMIS to HEMIS and had been developed incrementally by both the internal computer

support staff and by contracted amendments with the external software house. But no major new development had taken place. Money was allocated by Hefc to assist with the institutional restructuring. A new VC (KB) was appointed in August 1999 to take up post in September of that year, as a permanent appointment to replace the 'holding' VC and he was responsible for the final restructuring and repositioning of the university.

During the year 1999 there was further re-structuring of UofB into four faculties, which simplified the academic programme and responsibilities with the existing matrix of schools and colleges being abolished. (Note: In 1998/9 460 pathway combinations were offered, in 1999/2000 only 160 were offered.) This led to a significant number of lecturer redundancies (see above) as subjects were 'rationalised' and poorly recruiting degrees phased out. In addition, a business process re-engineering project was proposed to look at functions and process within the existing administrative services to determine which services should be provided centrally and which locally and to ensure that there was no duplication of effort, and that the information and management systems enhanced and supported the processes. It was noted in the Action Plan (UD13b 1999) that a lack of administrative co-ordination had resulted in institution-wide processes being hindered by 'managerial' boundaries with no shared set of boundaries. The Action Plan also noted that there had been a paucity of management information up until then and this needed to be addressed and thus would require future changes to the IS as the new structure bedded down, and in due course a permanent Director of Information Systems would be appointed.

By the end of the academic year 1998/99 there had been a further audit of the undergraduate provision, which had found that the curriculum was sound and that the NLE was bedding down (Higher 1998c). It was noteworthy that 71% of the FE courses inspected in 1999 were judged to be excellent or good which was above the UK average (Higher 1999a).

League Tables issued in 1999 (Higher 1999b) however showed UofB as having the 93rd lowest standard of entry and the 94th lowest level of achievement of firsts and upper seconds from students. The teaching score assessment was 90th in ranking, with research scoring the lowest rank of 97th as did the graduate destinations (those taking up

employment or further education). At the same time Linguistics was ranked a 5 in research and had a score of excellent in the teaching by the QAA and Sociology scored a 4 in research and also an excellent in teaching. In 1999 UofB was only allocated a 0.5% increase on funding (the lowest amount the government would award) as a result of its poor performance in relation to student progression and outcomes. The recruitment shortfall was exacerbated by the Government imposition of a £1000pa undergraduate fee that had led to a number of the poorer and more mature students either deferring entry or deciding not to participate in HE altogether as many were 'debt-averse', these students being the traditional entrants to UofB.

Speculation continued throughout the years of 1999 and 2000 that the university may be broken up or merged into other institutions (Ealing and Acton Gazette 1999). This did not happen and the university remained intact although a small number of departments were incorporated into other universities e.g. the School of English Language Education that moved to the School of Education at King's College, London in September 1999.

A number of attempts were made during the period 2000-2001 to divest (at least part) of the outer London site due to a lack of students at this site and the necessity for investment in infrastructure to bring the buildings up to the required standard, but no progress was made. This plan included demolishing all buildings except for the LRC and replacing them with new purpose-built buildings plus a civic space, but planning permission was not granted and development deals fell through.

Part of the process of re-invention carried out after the restructuring was to review the mission and perhaps to substitute a set of strategic aims. In the new culture of consultation and participation part of this process was undertaken through an IT supported Forum which produced a lively debate during early 2000. In addition, in 2000/2001 a new re-organisation of administrative functions was beginning again.

5.2.6 Conclusion

UofB planned in 1995 to set up Steering Committees to manage and develop the IS and IT strategy for the university. Financial control was (as is typically the case in bureaucratic forms of organisations) to remain within the control of the Finance

Committee, which would thus have the final say in all project allocations. A low level IT Strategy group did meet regularly (members appointed from amongst administrative management) and took on the Steering Committee responsibilities by 1997. The committee (see 5.2.2.3 above) had some devolved responsibility for budget expenditure and the development of IS/IT Strategy. It reported directly to the IT Board rather than the Finance Board.

Thus we can see that many of the hypotheses of McKeen and Guimares (1985) also hold true for UofB as well as UofA despite their very different internal environments. Yet the outcome of the two steering committees is very different.

In terms of the McKeen and Guimares hypotheses, we can see that hypothesis one does not hold true for UofB. No large systems project was ever authorised by UofB, only smaller projects and large concepts in terms of technological infrastructure came to fruition. Unfortunately, most of these projects were not completed successfully as shown above. Hypotheses two, three and five do hold true for UofB, the timetabling system and the smart card system had little or no vertical integration and were essentially lower level projects which could demonstrate tangible benefits. There appeared to be little attempt to produce formal cost/benefit analysis however, so hypothesis four does not hold true.

In relation to the conclusions of Doll and Torkzadeh (1987) however, the outcome for UofB was very different from that of UofA. There is some attempt in various reports (for example UD30 1996, UTR3 1995, UTR5 1997, UTR6 1995) to draw up an overall written plan for systems development but significant elements – such as how to tackle the MIS information issues – are missing. Budgeting and financial control are not strongly emphasised and are not evidently sophisticated, nor is there evidence (rather to the contrary) of a commitment to provide stable funding. Additionally, as the discussions above show, there was no mutual agreement on a set of criteria as to which projects to begin with, rather this appeared to be driven by external happenstances.

Thus we see this story of complexity containing many actions and reactions to the environment, both internal and external. The university mission was supported by its policies and tactics and it was successful in achieving many of its strategic aims. Yet these

policies and tactics also contained the seeds of failure that left the university teetering on the brink of chaos. The strategic decisions were made with little consultation and often by diktat there being a top organisational culture that did not lend itself to wide consultation. This top management style left lower ranking management and the 'normal' echelons of staff disaffected both with the management of the organisation and also with many of the policies imposed upon them.

The level of disaffection was compounded by the frequent shifting of posts of senior management, which meant that projects begun were left without supervision or follow-up by the new post's incumbent. Thus the IS projects were left in limbo and never completed and the committees that were set up to manage these issues met infrequently and were often abandoned as top level policies changed or made their function redundant.

UofB failed in a number of areas – firstly it failed to complete the cycle of implementation of its strategic information / IS / IT policies. It also failed to consult adequately and thus to understand the criticality of the ISs proposed to the running and implementation of the NLE and the university. The boundaries of the systems and the planning constituencies were set too narrowly to include the necessary knowledge. This was compounded by the loss of important / relevant stakeholders as either they were moved from their positions or they left the university due to re-sizing, redundancies, or job moves as they couldn't cope with the continuous uncertainties. The original VC (MF) fell into the trap of many top managers of being unable to complete a job - he was not a 'finisher'. Most managers however, appoint project managers to complete the work while they move onto something new. This was not the case with MF. The deputies and senior management moved post too frequently to maintain the impetus on the IT/IS projects. They were in addition, not prepared to report 'bad news' to the VC about subjects that were no longer at the forefront of his attention (The Lecturer 2001).

Thus we see a contrast in the two universities in their style of decision-making and their implementation of strategic IS/IT policies. The overall organisational culture and style of decision-making impacted on how they managed their affairs during the period under study and the outcome of similar requirements for a similar purpose was very different.

Chapter Six looks at the data from the two case studies and aligns it with the weaknesses identified in Earl 1993 as discussed in Chapter One. It proposes a framework for SPIS with novel tools and combinations of techniques to alleviate insufficiencies, in the process of SIS planning, as identified in the cases analysed above.

CHAPTER SIX

Data Analysis and the SPIS Framework

6.0 Introduction

This chapter provides the detailed analysis of the data collected for the two case studies whose organisational stories are told in Chapter Five and proposes a framework for SPIS with novel tools and combinations of techniques to alleviate insufficiencies, in the process of IS planning, identified in the cases analysed.

In Chapter Four the theory of grounded data analysis as a methodology was introduced and in this chapter the cycle of data analysis as described in Section 4.5.1 is shown in detail. This chapter also details the proposed framework offered for the SPIS process and shows how specific tools – the Stakeholder Web and the Interaction Matrix – were used firstly for data analysis in the case studies and secondly their place in the SPIS Framework.

Grounded data, as used in theory development, must derive validity from the robustness of analysis. This chapter therefore covers in depth the data analysis techniques, the data reduction performed and the analysis cycles undertaken. It begins with a discussion of the data archives and the document analysis database (Document Indexer) utilised to compare and contrast the case study material. The chapter continues with thick descriptions of each organisation detailing their performance (as drawn from the data analysis) against the typology of weaknesses in the SPIS process as identified by Earl (1993) and discussed in Coakes and Elliman 2001 (see also Chapter One). Data from the narrative analyses are also presented as confirmation of the performance of UofB. The chapter continues with a discussion of how the tools were developed for analysis within the framework and the strengths of the framework to alleviate the identified organisational weaknesses in SPIS are then illustrated.

Finally the chapter discusses the findings in relation to the issues raised in Chapters Two and Three.

6.1 Data Analysis Techniques

In Chapter Four the research methods and tools for analysis were introduced. It was argued that case methodology was appropriate for studying organisations undergoing change as this process merited a holistic view of the dynamic processes. It was also argued that case studies are of value where theory is at a formative stage, and in this chapter, the SPIS Framework described, is theory in development.

In Chapter Five the case studies are described using the means of the organisational story. As argued in Section 4.4.2, from the perspective of this study it is important that the stories not only demonstrate their unique qualities but also the similarities that permit of lessons to be learnt for other organisations undertaking the process of SPIS. Below in Section 6.2 through the use of the thick descriptions, drawn from the data analysis, is demonstrated both the qualities of uniqueness and similarity in the organisations.

Over the course of the years 1993 – 2001 a large number of documents were collected from the two case study sites. In total 372 documents for UofA including interview transcripts, papers from Governmental bodies and meeting agendas were collected – of these 152 were analysed on the Document Indexer. For UofB, 284 documents plus 15 interview transcripts from 18 interviews were collected (three interviews were written up as notes rather than recorded and later transcribed). Of these 16 interviews were written up as Narratives (see Chapter Four). The documents collected for this case study (of which 17 were analysed on the Document Indexer) included a large number of internal newsletters and Trade Union documents, books (on relevant historical events), newspapers, official government publications or documents sent to the university, and internal communications such as memos or emails, which were not considered for textual analysis but which were used to create the organisational story and the thick descriptions.

The choice of which documents to analyse was of course, subjective. It related to the study of SPIS and the relevant organisations. Although additional documents were considered for inclusion, in the end, they were not analysed, as they did not show the organisations under study's views on this process.

6.1.1 Using the Document Indexer

In order to perform the grounded data analysis on the archive documents a Document Indexer was programmed. The Document Indexer allowed free form input of text fragments attached to a document number, page, paragraph and line identification, with a number of identifiers attached. These identifiers are 'terms' as described below in Section 6.2.

At the time analysis on the texts commenced, the most commonly used text analysis software programme (NUD*IST™) was considered for this purpose and rejected. The requirements of this software programme that terms (descriptors and identifiers of text fragments) and term trees (the linking of the descriptors into hierarchical parent-child families for the grouping of connected text fragments) be pre-defined before analysis commenced, meant that theory could not be permitted to emerge from data as analysis progressed. This pre-definition prevents grounded theory validation and thus was considered unsuitable for this research project. The Document Indexer programmed permitted a tabla rasa implementation whereby descriptors were added and manipulated into term-trees at anytime during the analysis. When performing the analysis, terms for segmentation and identification were either taken from previous terms listed for inclusion or could be added as required by each document/text fragment. At the end of each session of text fragment addition, the terms added, and previous terms, could be examined, compared and then moved onto a term tree as required. A number of terms could be grouped together into 'families' and a new 'top' term that identified the grouping added if required. In addition, corrections could be made to the spelling or, in the case of a term phrase, the ordering of the words. This process of examination allowed issues to emerge during text fragment additions and allowed additional text identifiers to be added on re-examination of the issue tree. Consistency of usage of terms could therefore be assessed and the tree reviewed to ensure that no new families were required or that 'old' families were still valid. In addition, as new terms were added to the term tree, earlier text fragments were re-assessed as to whether they also fitted this descriptor. These changes were automatically updated to all text fragments already existing in the database. The term tree could be created and adjusted at any of these 'housekeeping' sessions and terms, including their dependents, could be moved at will.

Lincoln and Guba (1994) call this way of working 'pattern coding' where issues and identifiers are grouped into themes or constructs, and in particular referred to:

'filling in' – where codes are added and a coherent schema is constructed and reconstructed as new insights emerge and new ways of looking at the data emerge;

'extension' – when the researcher returns to materials coded earlier and interrogates them in a new way with a new theme, construct or relationship;

'bridging' – where the researcher sees new or previously not understood relationships within units of a given category;

'surfacing' – where the researcher identifies new categories.

In order to take advantage of the flexibility of this Document Indexer, it was decided to analyse the documents from the two cases on separate databases without reference to the previously input sets of terms. Thus any overlap in terms is purely due to the similarity of ideas and concepts that the texts brought out (whilst acknowledging the researcher's subjectivity in the process of investigation).

It is therefore interesting to note the comments below where similarity and differences in terms describing the text fragments are noted.

6.1.2 The Case of UofA

The 152 documents analysed on the Indexer yielded 1135 text fragments and 392 terms. These terms were grouped into a term tree with up to 5 levels emerging in some cases. (See Appendix Four Table A4.1 for a full listing of all terms and in Figure A4.1 a sample of the 5 level tree, is provided).

6.1.3 The Case of UofB

The 17 documents analysed on the Indexer yielded 161 text fragments and 221 terms. These terms were grouped into a term tree with 4 levels emerging in some cases. (See Appendix Four Table A4.2 for a full listing of all terms and in Figure A4.2 a sample of the 4 level tree, is provided).

6.1.4 Identical Terms

These top terms for both organisations were compared and 23 were found to be identical. These 23 identical terms are shown in Appendix Four Table A4.3. This table also indicates the percentage of times in each database the term was mentioned by number of text fragments associated with that term.

It is important to note that as the terms were input and attached to text fragments without prior reference to any previous lists, they were not necessarily used identically in each database. As an example, in the UofA database the Top Term *Project* had linked to it the details of all the systems projects that were developed or considered for development in UofA. This was relevant as these were also projects in the sense that resources were attached and the projects were planned and in many cases implemented. In the case of UofB however, these systems projects were linked to the Top Term *System* as although a number of systems were discussed and planned, very few systems were actually resourced and implemented.

Whilst the differing number of text fragments input and documents analysed will of course affect the percentages shown, as the intention was to choose similar types of documents for analysis a number of interesting points emerge.

Firstly, the comparison of the number of similar types of documents that could be analysed. This was a reflection on the individual organisation's way of working and organisational situation during the period under study. The documents from UofB all relate to the period 1994 to 1999 with SPIS documents effectively only spanning the period 1994-1997. Later documents relate to the re-organisation of UofB and the need to consider SPIS but no actual strategic IS planning was done during this latter period. There is a comment in a document about the university made in 1999 that expresses surprise at the lack of planning after this period:

> "Perhaps the most central management process in any organisation is the one that produces the strategic plan, the operational plans and budgets and the resulting resource allocation. We were surprised to find that a fully comprehensive process does not yet exist in UofB." (UD13c 1999).

In UofA the SPIS document collection commenced in 1993, and ended in 2000, being clustered around the years 1993-95, at which time the information systems under discussion began as projects to be implemented. Later updates to strategy are included on a regular basis in the documents but no major changes are made.

Secondly, a number of identifiers are as shown above, common to both organisations and a number are unique. The common items are discussed below in Section 6.1.5 and in Section 6.1.6 the unique identifiers are discussed to try to discover why they were of concern to the individual organisations.

6.1.5 Common Identifiers

6.1.5.1 Themes that are both common and of similar importance

In both organisations a number of themes emerged that had a broadly similar emphasis in the documentation. One of the most interesting of these themes, is that of change. However, although these themes may have had a similar importance to the organisation, the underlying emphases may have been different. For instance, in UofA change was associated with primarily change management, changing environment, changing needs, changing role, organisational change and rapid change. The changing environment being associated with changing technology, external changes and external factors; with organisational change being associated with culture, organisational issues and cultural change. In UofB the emphasis is somewhat different with change being associated with barriers to change, breadth of change, business change drivers, change overload, change potential, depth of change, external change, and speed of change. It is important to remember here, that as argued in Chapter Four, the process of planning for new or amended IS is also the process of planning for organisational change. Thus all these terms can be expected to be found in documents relating to the SPIS process. Here it is the differing emphasis that is of importance rather than the occurrence of these terms.

In contrast the term competition had more similar emphases – in UofA it was associated with competitive edge, competitive environment and successful competition; and in UofB it was associated with competitive advantage and external competition.

6.1.5.2 Themes that are both common but of different importance

As to be expected, each organisation's culture will impact the organisational concerns so that whilst the environment may cause common themes to emerge, the internal culture will place different emphases and importance on them.

In UofB for instance the term communication was used more than five times more frequently than in UofA, and the term data was used more than twice as often. This reflected the stakeholders' concerns relating to a perceived lack of communication both up and down the organisation, as well as sideways. Additionally, UofB was particularly concerned about the quality of the data supplied, with many interviewees perceiving this to be poor or inadequate for the purposes they required (see discussion in Chapter Five). In contrast, in UofA the term efficient was used five times more often than in UofB and information nearly twice as often and these terms were identified as prime aims of the SPIS process. Interestingly, the term finance was used again five times more frequently in UofB and as has been seen in Chapter Five and will note again in the thick descriptions, the lack of finance was a particularly problematic issue for UofB.

6.1.6 Unique Identifiers

A number of terms were found to be unique to each organisation. For UofA twelve terms received more than 1% of mentions within the documentation and for UofB five terms received more than 2% of the mentions (this was a higher number due to the lower number of text fragments). It was these unique identifiers that emphasised the differing characters of the organisational cultures. It was seen that the unique identifiers for UofA reflect a serious organisation by the inclusion of such terms as functionality, integration, co-ordination, reliable, with rules and regulations typical of an organisational bureaucracy, which is how they are identified below in Section 6.2. In UofB the terms are more diverse and more organisation-centric. In UofA terms utilised additionally recognised that the strategic planning process and the IS associated were operating in an environment that was continually evolving and that required consideration of local needs.

The thick descriptions of the two case study organisations are now considered. Thick descriptions are intended to give the context of an experience, and should indicate the

intentions and meanings that reveal the experience as a process (Denzin 1994). Thus we can say that thick descriptions are used to reveal all the aspects of the complexity of the situation (Holliday 2002) and are intended to discover patterns in order to 'work up' from data towards theory construction (Richards & Richards 1994). In the end however, it is the use that is made of the data in this study that completes the thick description (see the arguments in Holliday 2002 for uses of thick descriptions in case study analysis). In this study they are specifically utilised to discover the SPIS approach and weaknesses identified in the case study organisations.

6.2 Thick Descriptions

In this section the two case study organisations are analysed against the weaknesses that Earl (1993) described as being typical of the SPIS process (see Chapter One for further details). Firstly the organisations are identified as to their typology of approach to the SPIS process and secondly each organisation is considered against the weaknesses.

Earl (1993) describes five approaches to SPIS. These are:

Business-led;

Method driven ;

Administrative;

Technological;

Organisational.

These approaches, whilst drawn from research in actual business experience, are of course, typologies only, and therefore it is unlikely that any one organisation would conform totally to one approach. As suggested below and shown in Appendix Five Table A5.1, UofB and UofA show themselves to be primarily Administrative with elements of other approaches in relation to their under-pinning assumptions, the emphasis of their approaches to SPIS and the major influencers of the outcomes. An Administrative approach is typical of bureaucratic and hierarchical organisational control – in fact organisational planning and control styles are frequently deducible from organisational form.

In the Administrative approach a Steering committee would be likely to be the prime developer of SPIS, as in Earl's words 'only a procedure exists as method' (p231). By this he means that procedures per se (for SPIS) had not been drawn up but that the concept of using a committee such as a steering committee was embedded in the organisational culture as the correct way to 'go about doing things', and that such processes as were used in the committee hierarchy were considered as the 'method' by which SPIS should be undertaken. Earl goes on to identify some issues with this approach (see also below) whereby the Administrative approach gets only a medium rating on process, as it is dependent on user input, but because of its emphasis on resource allocation, approved projects are generally implemented. (Note here the issues with obtaining stakeholder input at UofB identified in Chapter Five and the lack of resource allocation meaning that projects did not get approved.) The Administrative approach in Earl's words 'reflects the prescriptions and practices of bureaucratic models of planning and control' (p233). The issues with processes in the Administrative form of organisations include the (length of the) time element from decisions taken until implementation, the complications caused by the many levels that processes need to work through from initiation to completion, and the many decision-points that result in any process undertaken being subject to inevitable delays. This gives Administrative organisational processes a medium rating (in Earl's terminology) as they are completed, albeit slowly, and perhaps not by the most effective route.

The UofB/UofA Organisational Form

UofB and UofA – are hierarchical and bureaucratic in form with a belief in committee structures and with the Vice Chancellor being supported by a small senior management team for all major decisions. They have a narrow organisational configuration – essentially what has been described as a professional bureaucracy (Mintzberg 1993) – where some central control is reduced to enable an increase in the autonomy of the staff. In the case of universities this structure and form provides the opportunity for individuals to pursue their research interests and use their own particular skills and expertise to further the interests of the organisation. Essentially though, organisations of this type tend towards a bureaucratic stance, since there are controls and rules that overarch any perceived autonomy in order to deliver their 'product' consistently. In UofB there was an increase in central control due to the perceived desire of the VC to 'break up' existing power cliques and strongholds (again see Chapter Five for stakeholders' views on this). Research was not strongly emphasised in this university, which saw its prime aim as teaching. As a result there was an increase in the number of central committees involved in the planning processes but the membership of these committees was limited in the range of stakeholders (see the Webs in Chapter Five – Figures 5.4 and 5.5). Indeed, during the first four years of this case study tracking, the period during which the interviews took place, the Administrative form of organisation grew stronger as power to control resources was removed from local to central budgets, committees etc. and consultation with staff was low. This is illustrated in the organisational story in Chapter Five.

In UofA, in contrast, an attempt to extend the range of stakeholders in the decision-making processes was made both through increasing membership of the committees and also through the road shows carried out. However, as the Stakeholder Webs in Chapter Five indicate, an insufficiency of stakeholders was actually involved in this process.

In Handy (1981), he discusses the expectations of a bureaucratic role, which, through providing incentives for disciplined action and conformity to the official regulations, often leads to timidity, conservatism and technicism. The work of the functional departments into which a bureaucracy (or Role culture in Handy's terms) is divided are

highly specialised and interaction is controlled by procedures for roles; communications; and the settlement of disputes. This timidity or conservatism frequently leads to the weaknesses that Earl identified with the Administrative approach to SPIS and the organisations are analysed along these weaknesses in Section 6.2.1 below.

6.2.1 Weaknesses of the Bureaucratic Organisational Form in Relation to SPIS

Earl classifies the Administrative approach as being typified by bureaucratic planning methods. In these organisations planning is typically 'bottom up' with a focus on resource-allocation processes where spending limits are applied and budgets risk being cut (see Earl's 3-pronged planning model, 1987).

As can be seen from Appendix Five Table A5.1, UofB was primarily an Administrative organisation in its approach to SPIS and UofA was a mixture of the Administrative approach and Business led with some elements of the Method Driven approach. We can identify these characteristics along the fourteen identifiers used by Earl for classification. Of these identifiers the three major relate to the underpinning organisational assumptions, the emphasis of the approach taken to SPIS, and the major influence(ers) of the outcome. A typical Administrative organisation, according to Earl, will ensure that the SPIS should follow and conform to the firm's management planning and *control procedures, and will use resource planning and steering committees as their* major emphasis and influence(r). With UofB, in Chapter Five, we see that for these three characteristics although there was some emphasis on the business plans and needs driving the SPIS, primarily the SPIS (so far as it happened) followed the planning and control procedures and was undertaken by resource planning and steering committees. With UofA there was more emphasis on business needs than following planning and control procedures, but that SPIS was undertaken by steering committees and by resource planning

Earl (1993) identified specific weaknesses for each approach as shown in Appendix Five Table A5.2. In particular, Earl identifies the weakness of the Administrative planning approach (and by implication the organisational form that adopts it) as being that:

No application can be developed until it is on the plan;

Ideas for radical change are not identified and the adoption of new strategic enterprise-level applications is rare;

Planning activity is frustrated, with claims about power plays and political influences given as the explanation;

The organisation focuses on the resource-allocation process.

The whole process is characterised by inertia – endless planning that delivers very little by way of strategic vision or adaptability. Such bureaucratic organisations are slow to change and to react to changes in their environment, and are co-ordinated at the top by a narrow band of senior management. They depend for their success on the relative stability of their environment.

Below is demonstrated that strategic IS planning at UofA and UofB show evidence of all these weaknesses. The author argues that use of the framework, due to its consultative and inclusive nature, shifts organisational form towards more cross-functional working and collaborative working practices that are more typical of a network organisation with a flatter span of control. For the purposes of SPIS, it is argued, a more inclusive organisational form provides increased retrieval of stakeholder knowledge and therefore assists in setting more appropriate boundaries. These more appropriate boundaries thus alleviate issues raised by the above weaknesses. These discussions are drawn from the case study documents (as analysed on the Document Indexer) and also from the narrative stories as developed from the interviews at UofB. In these, the members of the corpus construction were permitted to tell their own organisational stories in particular in relation to their experience of using the central administrative computer systems and the planning for the future. (See Appendix Six for a full example of a narrative story.)

Weakness One - No Application can be developed until it is 'On the Plan'

UofA Case

In the UofA case it was evident that major applications were not developed until they had been firmly established 'on the plan'. For example, there was a five-year time delay between the identification that a new Student Record System (SRS) needed to be considered and its actual implementation. It was first noted that a new SRS was required in 1994 but it was not officially 'on the plan' for at least a year after its need had been noted by the ISSG. Its adoption was delayed by the superior Senior Executive Group (SEG)'s - to whom the ISSG reported and who also controlled the financial purse-strings - decision that a finance system was a higher priority (M2 1993). The problem appears to be that, due to the lack of stakeholder representation from the ISSG on the SEG, the inter-connectedness of the Finance system and the SRS was not realised for over a year. It was only when the adoption of an integrated package from outside the institution was under consideration for purchase that this error was rectified (M9b 1994).

When we look at the committee papers it is clear that several projects or studies were initiated but never completed and some just disappear with no record of a report back or formal closing of the issues. Such initiatives included:

1. A total package of information services and integrated technologies such as smart cards and document management systems;
2. Links with the associate and partner colleges for the student record system and library systems;
3. The installation of multi-media facilities in student accommodation;
4. A new system for marketing.

These projects appear to be ambitious without clear links to the organisational goals. With the benefits of hindsight and an independent perspective, we might argue that their demise was inevitable. However, more important, is the issue of why they were picked up so enthusiastically by the committee that was intended to make such judgements and then dropped. The record suggests several explanations for these lapses in interest once projects had been initiated:

The continual shifts in membership led to key proponents leaving the committee before a problem was resolved. For example, for the Personnel and Payroll system (described below) more than 4 stakeholders were involved at various times, not all of whom have actually sat on the committee, although they may have been co-opted onto working parties. Some of these staff physically left the university before system resolution; others withdrew from the choice process (these are identified in the documents by the term 'stakeholders' for tracking purposes);

Lack of resources (time and money) and other priorities appearing. For example, official references to the multi-media project (initiative 3) go as far as a pilot project in 1994/5 and then just cease without explanation;

Relevant stakeholders were not present, represented or consulted within the committee structure (such as the partner colleges in initiative 2).

One particular project came to dominate the strategy group's activities: the replacement of the student records system that had specific legacy problems. Although new in September 1992, the system was targeted at the pre-university college structure and inappropriate for the revised institutional status. This committee adopted a search for an all-inclusive integrated system offering: student records, finance, personnel, research, timetabling and more, an ambitious objective. The investigation was wide ranging, looking at commercially developed systems (including ones for the US market) and the JISC sponsored MAC initiative.

It is interesting to note that during this time the Personnel, Payroll and Finance departments also looked at more specialised systems for their own areas. In the end, a Finance system integrated with the Student Record System (SRS) was purchased but a stand-alone Payroll system was operated at an external bureau. A Personnel system integrated with the SRS, at the end of the study period was not yet fully implemented by the suppliers, and the Personnel department was continuing to use their legacy system. This outcome highlights a weakness in the ISSG's terms of reference, which may explain a lack of enthusiasm to act decisively for the institution in its activities. The committee had powers only to recommend decisions, not to take them, and it also had no budgetary responsibility. Representing and balancing the interests of different stakeholders is a demanding task and the incentive to attend and make the effort is diminished when the results are perceived to have little impact. An amount of frustration with the time delays inherent in group decision-making through such strategy committees is shown by the

number of systems that were developed and implemented by 'executive action' i.e. outside the committee's sphere of influence. An example is the marketing system. Mentions of this system ceased in the official record when the department concerned developed a system for themselves. It is noteworthy that the committee did not have a representative of the marketing function amongst its stakeholders. However, there is some indication that at least some marketing functions were integrated eventually, into Project G*.

Another failing in the group's decision making was the difficulty in separating technology and implementation from strategic decision-making. The committee spent much of its time on the all-embracing student record system replacement and its technological issues, a task that could have been delegated. Another example was the campus wide information system. Initial planning for this system was at a high level of detail that had to be discarded when the emergence of Internet technology and applications provided a readily implementable solution in 1995.

By 1997 the committee itself had recognised these problems in fulfilling its role effectively and recommended a revision of its structure to address its powers, its responsibilities, and to reduce its size. In particular, there was a need to address its relationship to senior executive decisions and validate the group's activities by giving it appropriate authority and responsibility.

These issues indicate the themes of decision-making, planning, policy and strategy that was reflected in the documentation. There was a concern, evident in the committee papers, that systems should be integrated and this delayed the decision-making process as integration brought with it the further issues of security (of data across many applications and users) and quality (across many 'inputters' of data). (See Appendix Seven for an example of an Indexer Report on documents in UofA referring to Data issues). All these themes meant a delay in getting proposals 'on the plan'.

UofB Case

The issue with UofB was that in actual fact there was little 'plan' to work to. Although a series of committees to develop Strategy and IS Strategy in general were suggested, appointed and sometimes met and reported, little actually happened.

No overall strategic view was being taken about systems in the university, which also meant that no overall decisions were being made (The Pro-VC). There was an intention to start a working group:

> "To look at sort of information needs for the university, that's going to be a Governor's working group which will start in September to do some sort of root and branch things about what we need to know..." (SHc 1997).

There were no reports forthcoming from this group and there is no evidence that the group actually ever met. Developments were made incrementally as a result of low investment and there were no plans for the major investment that new systems would require. We can certainly argue that the same weakness - i.e. that major applications are not developed until they are on the plan - is the case for UofB.

It was noted in a document produced in November 1997 as a result of staff consultation that there appeared to be:

> "... no long term, strategic implementation plan to work towards." (UD7b 1997).

And, in 1999, external consultants reported that there was a lack of strategic planning apparent in UofB and that a:

> "... fully comprehensive process does not yet exist in UofB." (UD13d 1999)

In fact in a 1994 IT Strategy document strategy, five major projects were identified - Electronic Communications between people; Document Access; Broadcast Information; Staff Development to encourage better communications; and non-IT solutions to overcome organisational barriers to communication (UD15).

In February 1997, (a hiatus of three years) a draft strategy for the university for the period 1997/8 to 2002/3 was produced, and in March, of the same year, a strategy for the

Development, Management and Control of IST/IT was also produced. Yet no plan for finance, acquisition and implementation of these systems was produced (see Chapter Five Section 5.2 for further details).

In the February document it states that one of the major drivers for UofB was:

> "... to be at the forefront in the harnessing of technologies and commercialisation of activities to support teaching and learning, enabling education at UofB to be freed from the constraints of time and space." (UTR4 1997).

In the March 1997 document it notes that the university strategy specifically identifies the harnessing of technology as being part of its Drivers and Guiding Principles and that the three organisational initiatives for change in form and structure as well as delivery of the curriculum had significant implications for technology.

In total twenty-two systems were discussed in the committee meetings from 1994 to 1997. Of these, most mentioned and discussed was a new SRS, followed by an improved system for Communication (including a Broadcast system) and a timetabling system. Of these, Email and a Broadcast system were implemented during this time period. A new SRS was not implemented during the period of the study as there was a lack of urgency about providing such a system. The Director of Finance when interviewed in 1997 felt that improving the SRS was possibly not necessary or not worth the effort. This was in contrast to The College Manager (1998) who was lacking necessary features for her postgraduate work, the Undergraduate Programmes Co-ordinator (1998) who did not feel that the current SRS was reliable in some aspects; and the Director of Registry Services (1997) who commented that the SRS was 30% of the process in the Registry and 40% of the problems.

Whilst it was clear the existing inadequacies of the current central system at UofB had resulted in a number of people developing 'side' systems to cope with these perceived inadequacies (The Undergraduate Programmes Co-ordinator 1998), no real attempt to develop a replacement system was made. There was a general awareness that the current system was not providing all that was required as mentioned by the Pro-VC:

> "I recognised that UofB had seriously under invested in its IT systems and had attempted the sort of cheap and cheerful solutions... but I flagged up at that stage with AW and also with DJ, the need for us to have a fully integrated management information system which enabled the university not only to manage its operations in a detailed way, but also to some planning statements, forecasting, which drew across data on students, staff, financial resources, those sort of things. And also enabled us to have a much better idea about students' performance and monitoring than at that stage we were able to do." (SHd 1997).

The Pro-VC commented that no strategic view was being taken about systems in the university, which also meant that no overall decisions were being made. The incremental approach was a result of low investment, so they were:

> "Limping along with a system which makes it very difficult for a whole set of people in the university to do their jobs." (SHc 1997).

We see thus in the case of UofB, no major administrative systems were developed although a number were discussed and even initially planned for (see Chapter Five). The end result being that the data that was being used was of poor quality and was considered internally to be inadequate and incorrect. This was to cause problems in 1997 as shown in Chapter Five and the lack of systems of a sufficient quality for the purposes required caused the organisation a number of problems throughout the case study timeline.

Thus the theme of quality evident in the documentation, as with UofA mainly used in relation to data, was a major concern. We also see that lack of strategy was evident although a need for improved communication and integrated systems was identified early in the process reported in the case material. Planning (and the lack of it) was a dominant theme in the interviews but rarely cropped up in the documents analysed (See Appendix Four Table A4.4 for an example of the terms used in UofA document analysis and the frequency of their attachment across the text fragments). The lack of a coherent decision-making structure meant that as there was no definite plan developed and accepted centrally, systems did not receive the necessary funding and permission for development.

Weakness Two - Ideas for Radical Change are not Identified and the Adoption of New Strategic Enterprise-Level Applications is Rare

UofA Case

In the case of UofA there were a number of forward-thinking stakeholders who advised the ISSG of their concerns relating to the lack of foresight expressed by senior management and in the IS strategy plan proposed. For instance stakeholders expressed concerns that the strategy was 'misguided' and parochial (D23 1994).

The failure to recognise such stakeholder input is emphasised by senior management's perceptions of the purpose the proposed applications. This is shown, for instance in the early development of web sites for UofA. This development was sponsored by the MIS manager himself and was strongly recommended by the ISSG committee as a way forward. Unfortunately, the SEG initially blocked this development because they felt that web pages were only useful as marketing tools and could not foresee other possible applications for them.

In the IS strategy documents devised by the ISSG needs were typically cast in terms of current systems with some changes, rather than recommendations of radical restructuring of the IS portfolio. For example they comment:

> "... the Finance system will need to be replaced in the near future.... Increased functionality is also needed in these systems to cater for such areas as modularity, work-placement, attendance monitoring, point-of-sale etc." (Wa4 1994).

This statement seems to imply the acceptance of a relatively isolated "finance system" needing replacement. It is dealt with as an isolated entity. The stated changes appearing almost as afterthoughts, which would be convenient to include in the replacement. This lack of radical thinking is typical of the bureaucratic organisational form. Contrast this with an organisation recognising the need to rethink how finance processes relate to a changing business environment. The author suggests their strategic plan might read some thing like this: The need to cater for changing provisions such as modularity, work-placements, attendance monitoring, point-of-sale etc will make the present, relatively

isolated Finance system obsolete. In the near future it will need to be replaced as part of our response to these needs.

The ISSG was further inhibited in its ability to identify radical change by its dependence on university business strategy. They were remote from overall strategy and forced to follow that which had been set elsewhere. Bureaucracies are typified by central control of all policy-making activities. This meant that on occasions their work was limited and decisions had to be held over until 'higher' authorities had completed their work. This is shown in statements made in the ISSG meetings such as:

> "It was also necessary for the future aims of the university to be defined before deciding priorities." (M23b 1996).

Thus we see that in UofA the steering committee did not have the authority to proceed with large system implementations or strategic decisions but were 'forced' to wait until 'higher' committees had completed their work - this leading inevitably to some frustrations within the committee and delays before new work could start. In addition, the many layers of authority needed to work through before a decision-making process is complete in this organisational form, make it more difficult to undertake 'risky' or innovative strategies as each committee will seek to mitigate and minimise their own responsibility for risk and responsibility.

The themes of change and complexity are evident when the documents are analysed in relation to this weakness. The committee members recognised the need to change university ways of working in relation to an increasingly complex and competitive environment. There was the need to consult with stakeholders on projects and potential systems in order to retrieve the necessary knowledge, but the decision-making body (the SEG) dismissed this knowledge and over-ruled the stakeholders (see the discussion above in relation to the web project).

UofB

In UofB discussion about systems requirements also took place a long way from the major decision-making bodies of the university. IT policies were designed to follow the Guiding Principles, which in turn supported the Business Change Drivers. It seems that

these Business Drivers had been derived from the Strategic Plan (UTR3 1995). A Strategy Roadmap with a portfolio of IS/IT expenditure decisions was published in 1995. The primary oversight body for IS/IT was the IT Board comprised of the two Pro-VCs and the Finance Director. Their role was to review and agree the strategy and to recommend overall budgetary levels and authorise expenditure on large projects. Below them was the IS/IT Strategy Group, which had the responsibility to develop and maintain the strategy; to hold the budget and recommend expenditure; and to assure that all expenditure was in agreement with the principles of the strategy. Below this was the IT Advisory Group, which fed recommendations into the IS/IT Strategy Group. Yet in 1994 the results of the original consultation and project suggestions and plans were passed directly:

> "... to the VC to enable Governors and senior management to consider information needs and IT strategy within the overall strategic plan for UofB." (UTR1 1994).

Whilst it cannot be said that for UofB ideas for radical change for the organisation were not identified, indeed the implementation of the NLE was an instance of organisational radical change, it is evident from the documentation and the interviews conducted that the underlying administrative systems were not changed other than incrementally during the period under study. No new strategic level application system was adopted and no radical ideas for such systems were ever mooted. Any discussion was mediated by the lack of resources made available or understood to be available for such purposes.

The SRS Data Team Manager (1998) commented that "bolting on additional systems was not the answer" although it was the practice at UofB. There was an IT strategy board but no IS strategy board so the policy was to give projects to the SRS developers (external) to develop where the internal expertise was not available (The Business Analyst 1997).

The Lecturer/Researcher commented (RWa 1998) on a paper he had written as research for his PhD, relating to an internal initial IT strategy document (see discussion under Weakness One and document UD15). In his paper he had identified that four out of the six major projects put forward had not only not been implemented but also had not progressed in any fashion (this can also be seen as endemic inertia). It was also noted by The Lecturer (2001) that the one project that had been implemented had been a 'major

disaster' and the sixth project had some consultancy work performed but had then been 'sat on' (again inertia).

Many of the documents analysed for themes discussed change and the necessity to change in order to compete in a complex environment. They mentioned the requirement for a holistic view of the organisation that involved flexibility in the way it operated and a need (very strongly emphasised at UofB) to be true to the organisational mission, vision and principles. However, it was apparent that finance was difficult to obtain in any secure manner, which meant that large projects could not be attempted.

Weakness Three - Claims about Power Plays and Political Influences are Common

UofA

The fear that stakeholder concerns would be subjugated to 'power-plays' and political influence were expressed during early discussions of the potential systems in 1994. For instance the Student Records Office expressed concern:

> "... that it would be left with no influence on decisions which had already been taken." (M9a 1994).

The SEG, although not an 'official' committee i.e. it did not appear on the formal committee structure chart, nonetheless, because it was comprised of most members of the university's senior management, with the authority to take independent action, had considerable de facto power. This included the ability to award or veto expenditure within a budget set by the Finance and General Purposes (F&GP) committee. There was no cross-representation between the ISSG and the SEG, which meant that there was no way of influencing the decisions made in the SEG. This caused a great deal of upset in the ISSG when their decisions were vetoed, to the extent that on at least one occasion the chair of the ISSG was heard to comment:

> " ... if they do this again, I'll resign." (MIS Manager 1999).

The documents thus show a lack of co-ordination in committee representation and issues relating to the multiplicity of committees involved in the decision-making process. Whilst

the IS strategy formulating committee concerned itself with a holistic view of the organisation, and their documentation reflected the need for systems chosen to be reflective of the organisational mission, effective in operation and flexible in their application, their suggestions were sometimes over-ruled by the power-wielding hierarchy.

UofB

The organisational story of UofB was a story of power and political struggles. Not in relation to information systems but in relation to the organisation and its workings, structures and strategic aims. This influenced all its activities and the way organisational decisions were made. Power remained under the control of the top management at all times and suggestions made by lower 'ranks' were rarely implemented. Certainly, as shown in the organisational story the claim that there were power and influence struggles came out strongly.

The School Director, who had been at UofB for some 15 months at the time of the interview, commented on this particular issue. The level of internal politics that caused, in her opinion, an amount of misinformation, backbiting, disruptive and destructive behaviour, dismayed her (1998). The issue of internal politics was also brought up by a number of other interviewees (especially the lecturers interviewed) including the Director of Registry Services:

> "... one of the things we've not got right in the organisation it seems to me is about this having proper adult grown-up debates about what we are and where we fit...
>
> .... here I just feel like sometimes I'm just one of the enemy, do you know what I mean...
>
> ... But there is a ... there's something about, you know, there's an 'us and them' attitude that is fundamentally disabling to systems in the organisation." (PH 1998).

The Director of Registry Services commented that when he first arrived at the university he saw all the problems with the central IS as being software related, now his experience showed him that many were human in origin, often political (1997).

Weakness Four - The Procedure is Essentially such that an Organisation Focuses on the Resource-Allocation Processes

UofA

In a typical bureaucratic organisation lack of power to set budgets is common of many lower-level committees and the ISSG was not at a power-holding level in UofA, it only held a mandate to recommend.

Central control of finance is prized highly in most bureaucracies. The SEG held the power not only to over-rule in budget setting but also to over-rule policy recommendations. Systems that were strongly sponsored on the ISSG committee such as the intranet were sometimes over-ruled by the power-holding SEG. That they did this on occasion was noted by the MIS Manager who gave as his belief that they did this because:

> " Their judgement was considered better than that of the ISSG." (MIS Manager 1999).

This despite the fact that people had been seconded to participate in the ISSG because of their interest in and knowledge of this area.

The issue of resources and finance was difficult for the ISSG. The overall budget was held by the Finance and General Purposes (F&GP) committee, which devolved this budget to the SEG. The SEG allocated finance as it saw fit. When the budget for the SEG was exhausted or not large enough, then projects went to the F&GP. In the documentation analysis the issue of resources and finance was discussed in 328 text fragments – just over 27% of the total text fragments analysed. Thus the ISSG itself focussed on budget allocation as an important issue yet had little or no influence on the allocation of these items.

UofB

As discussed above, in UofB, power was held at the very top of the organisation. This included budgets and resource allocation. Little or no financial decisions were devolved downwards. Thus the committees that were set up to review the IS/IT strategy were in the same position as in UofA, i.e. they could recommend but no more.

In UofB, as with most universities, no project can be started without some previous funding agreement. Funding, as we have already seen in Weakness One, was not available to any large extent in UofB and thus no major systems could be started. This was frustrating to a number of the staff interviewed including the Director of Registry Services who found that he could not do all he wanted to improve the current system due to cost issues, commenting that that even a relatively small sum (such as £25-45,000) was not available (1997). Money was the prime concern, before need, as little or no strategic planning was being performed (see Chapter Five).

The critical success factors identified in the documents included the necessity to prove the costs / benefits of IT investment (UTR1 1994). Yet there was little evidence in the documentation that this type of analysis was ever performed in order to justify the suggested improvements in systems. This may account for the lack of financial resources that were channelled into system development.

Endemic Inertia

The length of time that it takes to make decisions is a critical consequence of the weaknesses discussed above. For instance in UofA the initial planning process for the replacement of the central suite of Administrative Systems started in 1993 but the final recommendation as to which software to purchase was not made until late 1995. This means that the organisation is held ransom by environmental uncertainty and this is discussed further below. The document analysis found that early on in the process stakeholders in UofA feared that there would be a:

> " ... planning blight while decisions are awaited." (Ci21 1994).

This can also be seen in the lack of implementation of five out of six proposed projects in UofB's IT strategy plan (see Weakness Two above). Where projects were implemented they had proved to be in their terms 'disasters' and thus there was an inherent reluctance to implement more, especially risky, projects. Yet the School Director (1997) felt that MIS across the university was a 'nightmare', it was the root of a large number of administrative problems, caused a large wastage of people resources and a great deal of frustration amongst its users. As the Director of Registry Services comments:

> U(ofB)'s a bit like wading through treacle and every time that you know you think you've made a step forward, you have got two more weights put on your back as you find yourself moving backwards and that a lot of people have a lot of vested interests in the fact that the way it is is because of them (PH 1998).

This endemic inertia characteristic is currently causing difficulties in many universities where they are now being forced to operate in an environment where the wider body of stakeholders, in the form of Government, Governmental bodies (such as the QAA) and students (since the introduction of fees), are demanding a greater say in the standards and content of the higher education system. It has been said of the Chancellor of the Exchequer (Gordon Brown) that he requires 'something for something' (Higher 2002) and thus that all monies given to HE is given with strings attached in terms of where it can spent, on what and how, and what is required in exchange.

UofB's general inability to respond to external influences is further hampered by a lack of responsiveness in their (minimal) IS planning processes.

Discussion of weaknesses

These discussions above show the themes identified in the document analysis being reflected in the weaknesses displayed by the organisations under study. Both organisations were concerned about a number of issues equally, these included the idea of change - they both saw that the organisations needed to change to compete with the increasingly complex and competitive environment that they identified. Yet they tackled change in a different manner (see Chapter Five) as a reflection of the individual organisational culture and management style. Whilst we can identify that each organisation displayed the weaknesses to a greater or lesser extent, we can also identify, through the textual themes, the background thinking and reasoning as well organisational events that prompted these weaknesses. Decision-making styles had similarities and vital differences that impacted on the internal events and caused different issues to be flagged up in the documentation. UofA was primarily concerned with dealing with administrative functions and developing and maintaining a suitable system without overall major organisational change. UofB found itself undergoing several major organisational changes

and the underlying systems that supported the central administrative function, remained largely unchanged during this time period.

The proposed framework for the strategic planning of IS is now discussed, firstly working through and describing the various Steps that the framework proposes for the planning process, and then analysing the weaknesses as shown in the case studies and demonstrating how the framework would alleviate these weaknesses.

6. 3 A Framework for Strategic Planning for IS

The length of time over which the study was undertaken permitted the researcher to develop her depth of understanding of the topic and to develop, consider and discard theories as to the causes and outcomes of the processes being researched. Being able to track the SPIS activity from (almost) conception to (almost) completion in two organisations, permitted a consideration of what the relevant steps in such a process might entail and what might be suitable activities at each step. Study of the organisations permitted the researcher to postulate which steps were being undertaken by the organisations and which steps might usefully be added to improve the sufficiency of the process. The outcome of this process of consideration and theorisation was the SPIS Framework described below.

The SPIS Framework introduced here includes a number of novel tools for system planning for the organisation in its environment. The framework, it is argued, will enable retrieval of sufficient available knowledge to enlighten the SPIS process and improve the decisions that are derived from the process.

The researcher has classed the process developed as a framework. Avison and Fitzgerald (1988) argue that a Methodology has a number of distinguishing features. These would include: a philosophy; a paradigm which includes objectives, domain and target; a model or view of reality; techniques and tools; a scope; outputs; a practice which considers the background, the user base and the players; and a product.

The SPIS Framework described here, has a number of the elements of a methodology and is thus more than a set of methods. It is not intended as a prescriptive set of

activities that must be performed, but a framework of activities that can be performed. These activities can be flexed, added to, and subtracted from, according to organisational necessities, realities and cultural requirements. However, it does contain an underlying moral and philosophical imperative – that of the sociotechnical ideal of participation, self-determination and the optimisation of both people and technology. It would therefore fall into the subjectivist school of inquiry into an organisational situation. The objective of the SPIS Framework is to produce a strategic plan for the organisational information system that optimises the existing and potential organisational resources in a complex external and internal environment. The systems planned as a result of this process will be those considered a best fit for the current and potential organisational realities, with due consideration and best support for the organisational goals and objectives. The domain of the SPIS Framework described being the organisation at large. The SPIS Framework as detailed here offers a number of techniques and tools but does not claim that these are either prescriptive, or complete. Organisations have the choice to use or discard any that are offered. The output of the framework is, of course, a Strategic Plan for IS and this is also its product. The user base and players in the SPIS Framework will vary according to organisational need and culture. However, it is suggested that amongst the user base should be the systems planners, analysts and designers; IT/ IS and IM (Information Management) managers and directors; strategic planners, managers and directors; and that the players are the organisational stakeholders (see the definition in Chapter Two for who these would comprise) and the stakeholder representatives as chosen by them to represent their interests.

Overall the SPIS Framework is intended (as a result of the underlying moral imperative) to permit freedom and self-determination of what is utilised according to organisational choice and appropriateness for organisational culture.

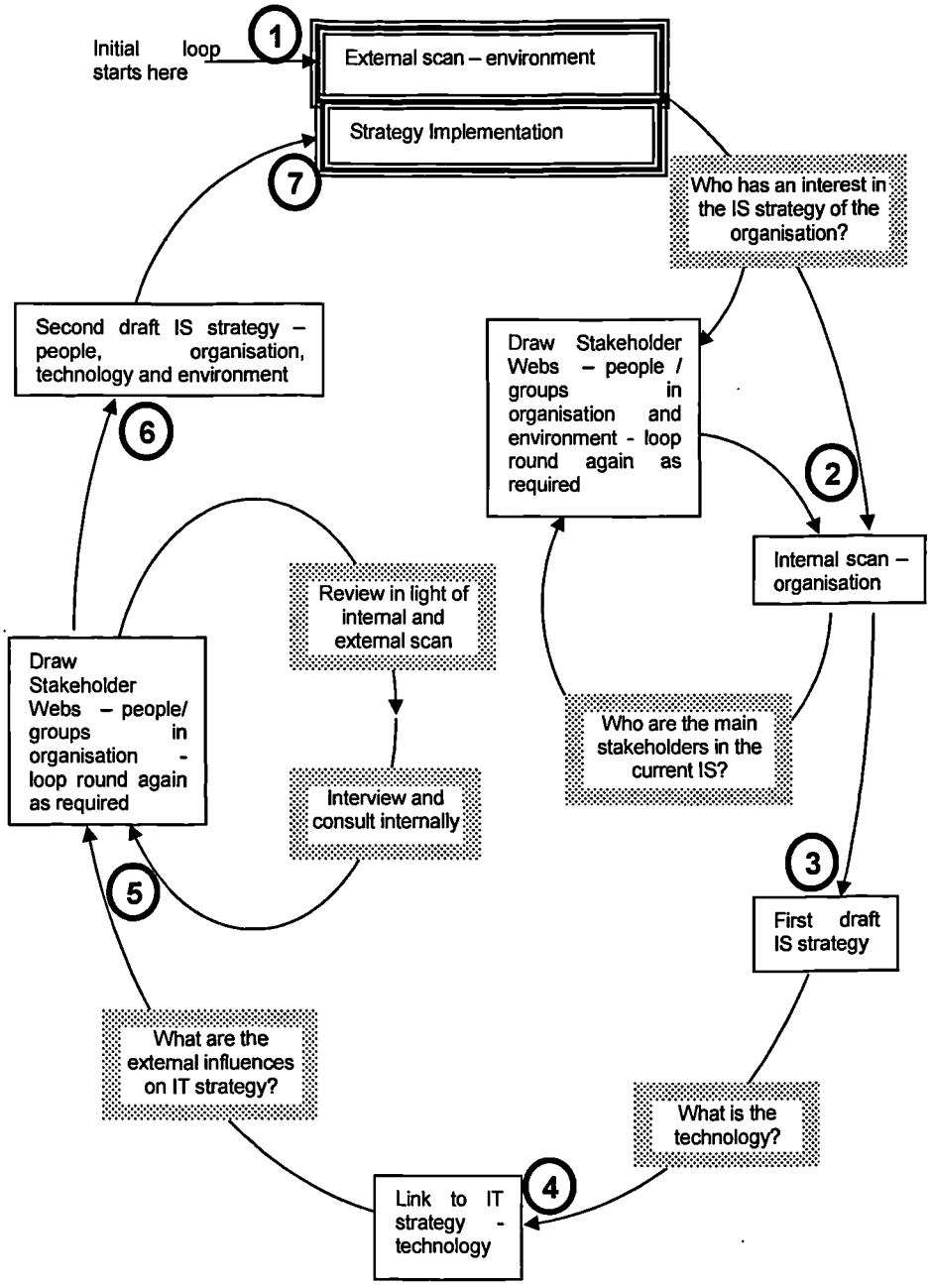
6.3.1 Framework Steps

The SPIS Framework consists of seven steps, each step being accompanied by a number of questions that should be asked with suggestions of methods and techniques that could be utilised to answer the questions posed (see Figure 6.1). Reflection and review of such methods for SPIS and its elements that exist, indicated that any process for the strategic

planning of Information Systems must contain a certain number of steps – these would be Steps Two- Seven as shown below. In addition, the moral imperative underlying this framework, and the arguments put forward in Chapters Two and Three, indicate that two further steps are required before these existing steps commence. Step One and Step Two are therefore unique to the framework. Additionally, identification of insufficiencies in existing steps has meant that additions have been made to Steps Three and Five. These additional steps and the concept of the single committee (see below) were drawn from reflections on the issues identified in the literature as discussed in Chapters One, Two and Three and the case studies in Chapter Five.

Below is outlined these steps and then in Section 6.4 each step is discussed in depth. A single committee that is empowered to make financial judgements as well as project decisions would undertake the process described within the framework. It is important that the decision-making cycle is shortened and that the number of levels that it progresses through are minimised, in order that decisions - once fully informed - can be taken more quickly and can be taken in full cognisance of the financial implications. Thus ideas for radical change cannot be over-ruled by higher or more powerful bodies. This single committee should be vested with full power for all decisions and thus must be comprised of suitable representatives from the stakeholder community. The SPIS Framework indicates how this representation can best be achieved. As indicated in Chapter One, such a committee whilst having some of the characteristics of a steering committee (in terms of matching planned systems to organisational goals), must ensure that it does not fall into the trap of only recommending and not completing the process of decision-making and implementation. It is essential that this committee completes the SPIS Framework lifecycle in its entirety, without delegation, in order that the identified issues as discussed in Chapter One, do not occur.

Figure 6.1 The SPIS Framework



Below are detailed the seven steps involved in the framework.

External scan – here a scan of the two external environments (the task environment and the general environment) is conducted. This scan will attempt to retrieve an initial set of external stakeholders of the organisation.

Internal organisational scan – this scan is looking for internal SPIS stakeholders and for their links both internally to other organisational stakeholders and their links to external stakeholders. In addition, this scan will audit the current organisational systems and their capabilities and potentialities.

A first draft IS Strategy is compiled. This draft will attempt to answer a number of questions relating to what is feasible for the organisation to do and what it would like to do if there were no constraints.

A review of information technology (IT) strategy now needs to be conducted. In particular the external and internal influences and constraints will need to be identified.

The draft IS strategy should now be reviewed in the light of the IT strategy review.

The IS Strategy will now need to be re-drafted ensuring that organisation; technology and people are fully covered.

Begin implementation but return to step 1.

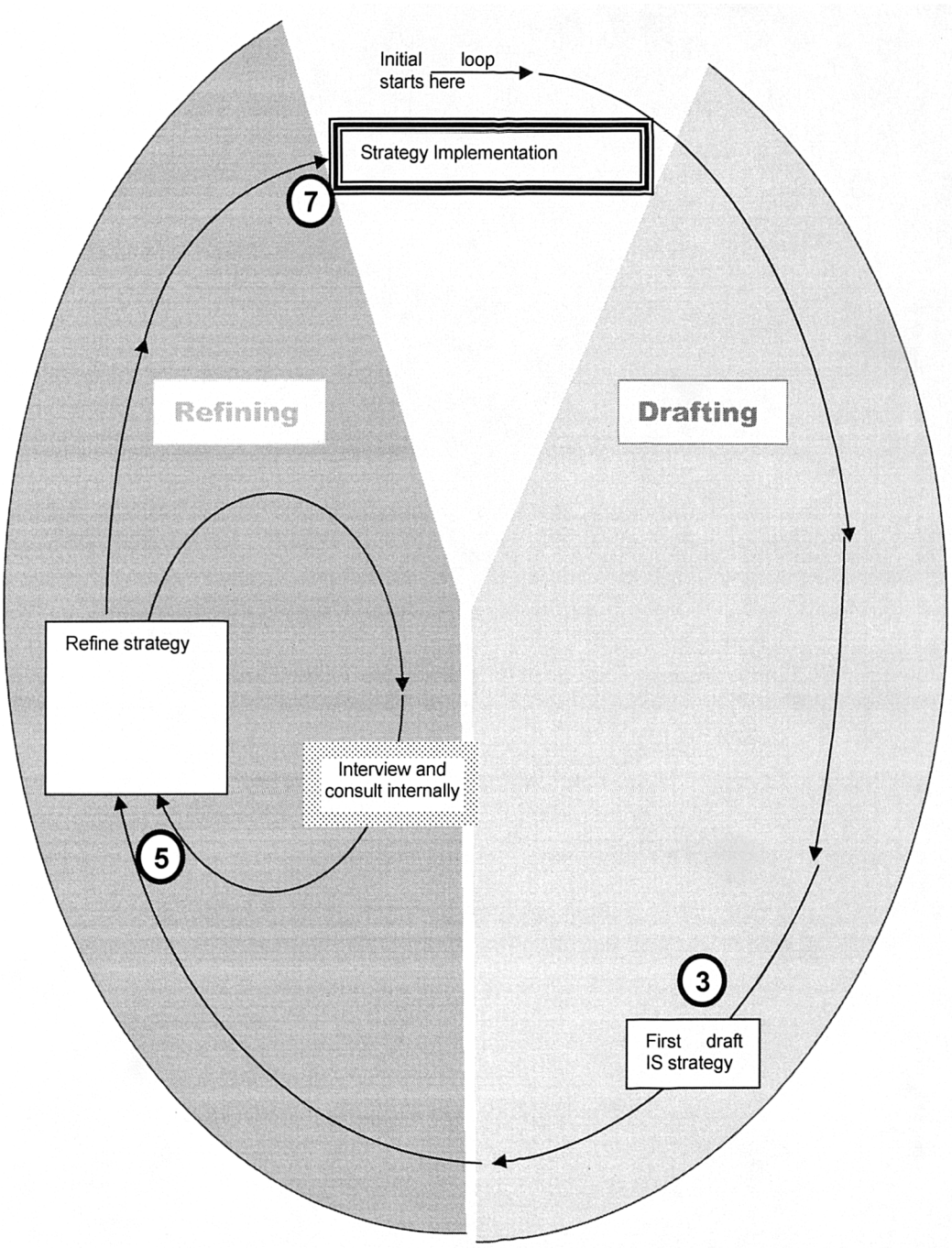
This framework has a number of unique steps that enable it to build a rich view of the stakeholder constituency for the process of strategic information systems planning. In particular Steps One and Two are unique in that both internal and external stakeholders are included within the process boundary and are represented in the strategy formulation process. The novel tools suggested – the Stakeholder Web and the Interaction Matrix – enable the assessment of firstly, the balance and coverage of the stakeholders represented in the process (Web); and secondly, representation and access to views (Matrix). The internal boundary is not pre-delineated in these steps but is left fluid for stakeholders to indicate their ideas of where it should occur (noting that these may not agree - see discussions below about how to alleviate conflict and multiple views).

Step Three enhances the more normal 'drafting' process of strategy formulation as it follows from Steps One and Two. By the completion of the external and internal scans and the retrieval of a more sufficient body of representative stakeholders, drafting of a plan will commence with a better knowledge foundation. As argued in Chapter Three, knowledge is held in organisational stakeholders and the better the coverage of this knowledge that is achieved, the better the fit of any strategic plan to the organisational environment and capabilities.

Step Five is also a divergence from norm in that it includes a sub-cycle that reviews the data and information retrieved in Steps One and Two against the draft plan as now drawn up, and suggests that consultation and review with internal and external stakeholders is performed again before a final draft is completed (Step Six). It is important to recognise that between Steps One and Two and Step Five the environment, both internal and external, may have changed and that this requires a re-assessment of the knowledge held by the stakeholders of the process, and thus of the plan, in the light of this revised knowledge.

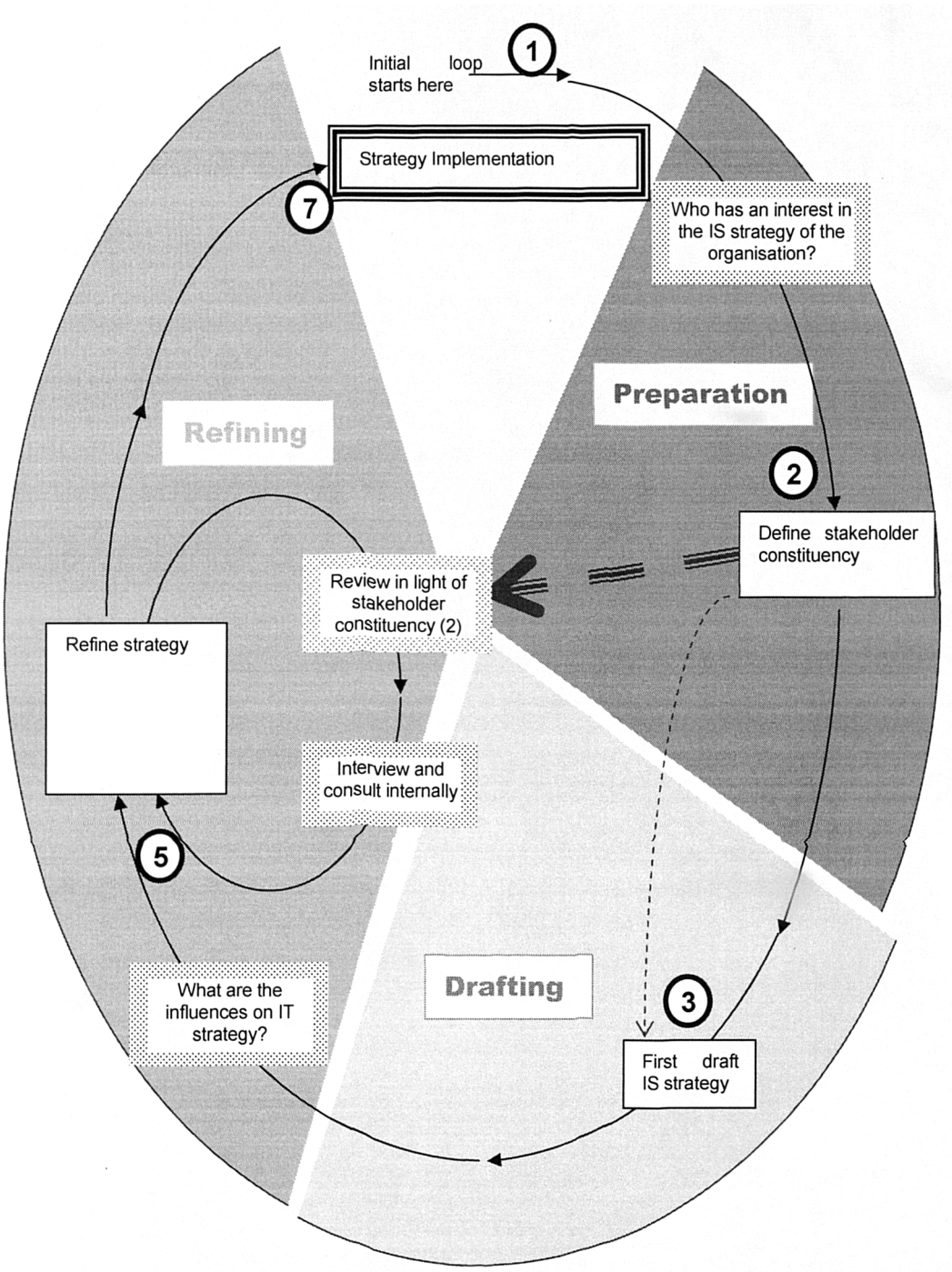
Although this framework is presented as linear, it would be unreasonable to suggest that implementation of short-term solutions should not commence before the long-term plan is in place. It is evident that the cycle of planning will take place over a period of time and during this period short-term projects may need to be implemented. This is not a problem provided it is understood that, in the long term, they may need to be discarded if they do not match the long-term strategy (Suchman 1987). Additionally, provided there are sufficient organisational resources available, it would be feasible to perform some steps in parallel. For instance, Steps One and Two could be conducted at the same time, as could Four and Five. It is also argued below that Step One must commence whilst Step Seven is still in progress. However, it should be noted that full implementation can only follow from a previously written strategy and that any plan will be iterated through a number of drafts before completion (this is illustrated in Figure 6.2). The iteration is required due to the complexity of the external and internal environment that is discussed in Chapter Three.

Figure 6.2: The IS Strategy Drafting Loop



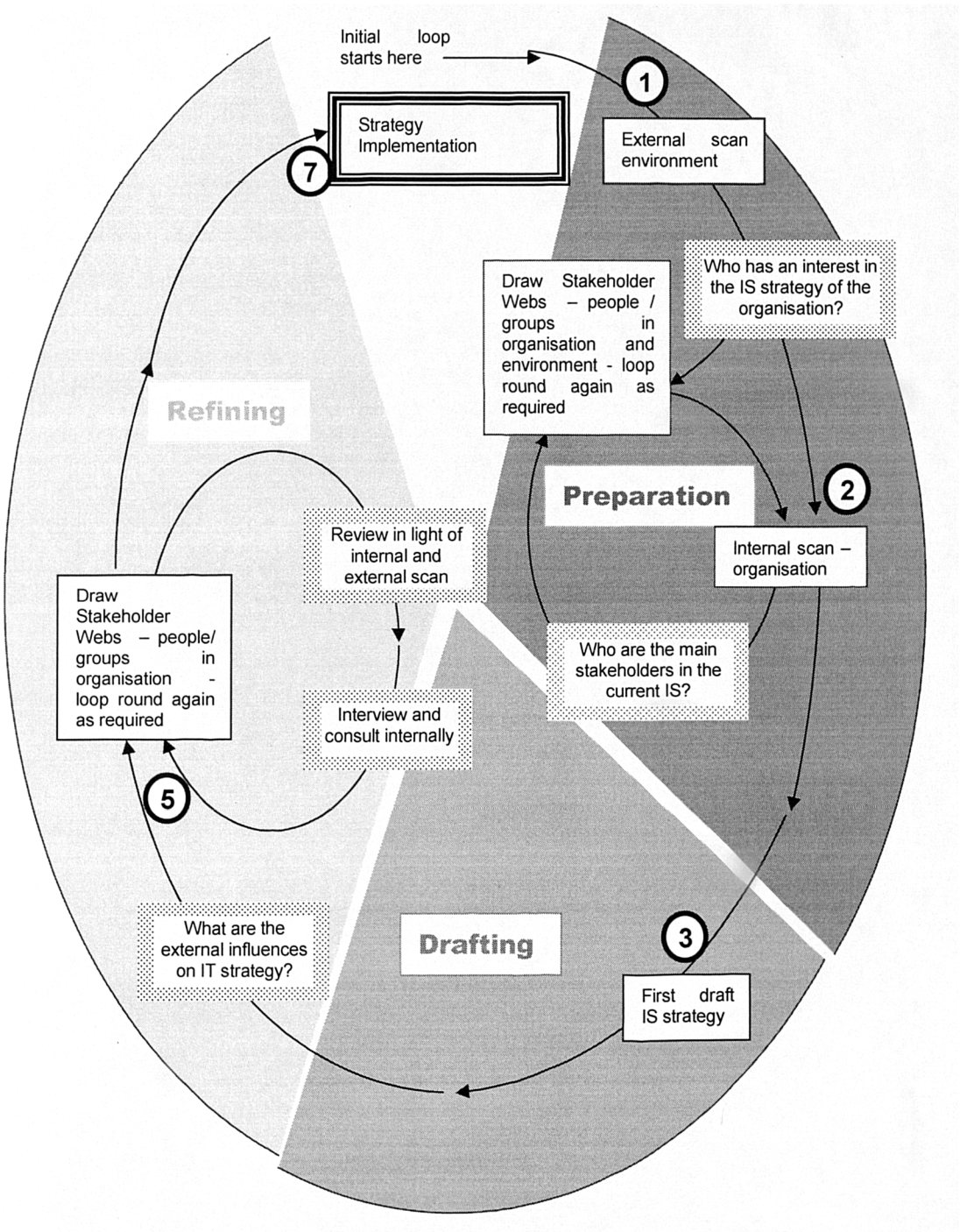
In order to retrieve the best possible knowledge about this complex environment the stakeholder constituency will need to be refined from the original definition and consultation to a new, and perhaps more valid constituency, over the strategic plan refinement period. This process can be illustrated through Figure 6.3. The initial constituency informs the first draft of the strategy, the re-defined constituency, informs the refinement process.

Figure 6.3: Defining the Stakeholder Constituency



Stakeholders as previously discussed and argued, are both internal and external to the organisation. They are also either drivers or influencers as argued above and in Chapter Two. Clearly, driver stakeholders must be consulted during the refinement process and the influence of other stakeholders must be taken into consideration. Stakeholders, over the period of strategy refinement may change status from driver to influencer and vice versa, and thus their status must be monitored. It was also emphasised in previous discussions about stakeholders, that many influential stakeholders may lay outside the organisational boundaries and must thus be discovered and their concerns addressed. The external scan is intended to discover the external stakeholders and their status, and the internal scan is to discover the organisational stakeholders and their status, in order that the best fit constituency is derived. It is these processes that the use of the Stakeholder Web and Interaction Matrix is intended to illuminate. In addition, (see Figure 6.4) access to these external stakeholders will need to be developed through this iterative process.

Figure 6.4: Refining the Preparative Work to address Internal and External Stakeholders



The framework has a number of techniques or tools associated with it. In the sections 6.3.2 and 6.3.3 below *is discussed* two unique tools – the Stakeholder Web and the Interaction Matrix and show their role in the process of SPIS. As our ideas of the organisation in its environment develop, so too does the Stakeholder Web. It is argued that the use of these tools will enable the retrieval of sufficient available knowledge, through the use of a more inclusive set of stakeholders, to ensure a better fit of the strategy to the environment, both internal and external. The tools indicate a more appropriate system boundary than is normally discovered in such processes.

In Chapter One, five argumentation steps were put forward relating to why a more inclusive SPIS process was required and here is shown why the framework proposed answers this argument. Two further steps are now added - six and seven:

6. The framework proposed is informed by sociotechnical context, which approaches change in an holistic and participatory manner, encouraging a learning organisation that manages the knowledge of both its internal and external environment.

7. The framework proposed addresses and alleviates issues identified with SPIS and the inappropriate setting of boundaries and thus the incompletion of knowledge retrieval. The framework shows ways of obtaining the required knowledge.

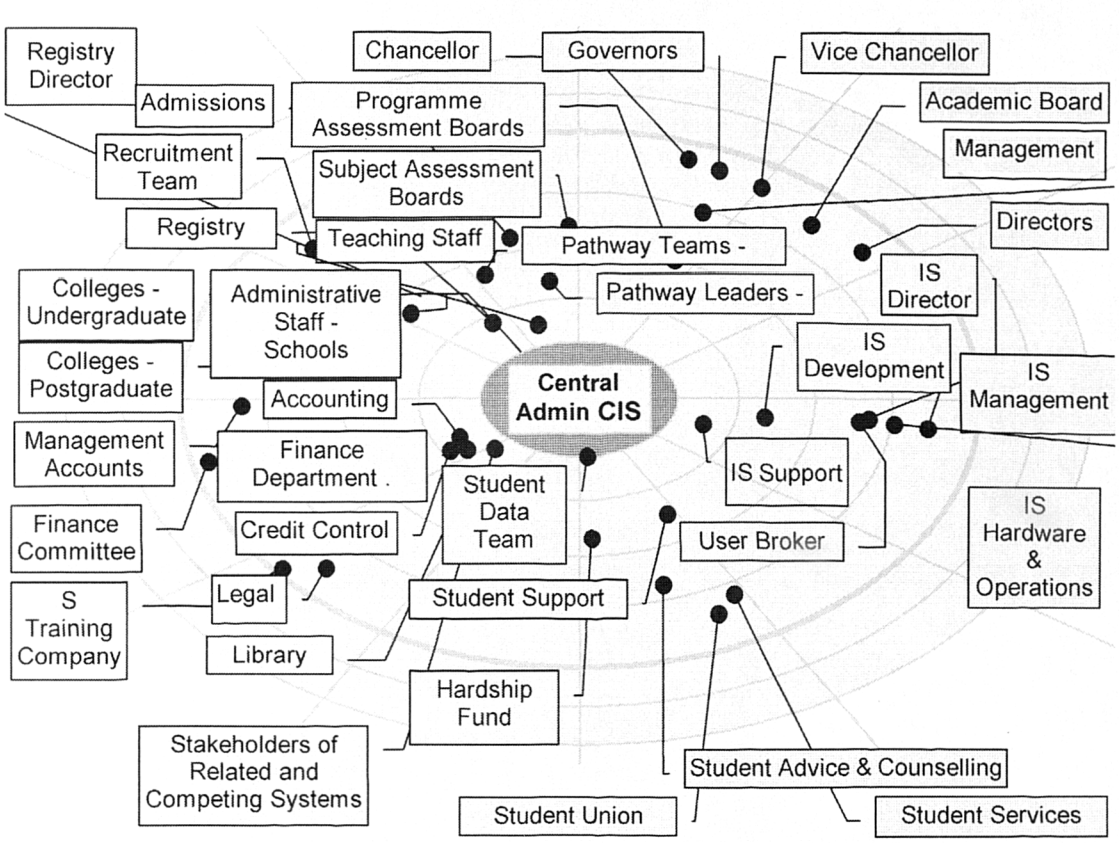
6.3.2. The Stakeholder Web

To grasp the complexity of a CIS and its stakeholders within an organisational context the researcher has devised a diagrammatic model - the "Stakeholder Web". The web shows a classification and grouping of stakeholders using a holistic view of the situation. This web was first described in Coakes and Coakes 1994, as a means for identifying interested parties, and has since been adapted and enhanced (Coakes and Elliman 1997, 1999, 2001). In a web, the target CIS (or SIS plan) is at the centre of a series of concentric system boundaries. Each boundary represents a wider view of the system and its impact. The inner boundary will encompass those having direct contact with the system. Moving out the circles of influence continue until the organisational boundary is reached. Then wider boundaries still - the social, environmental, community, economical or political boundaries for instance - will be reached. Whilst the organisational boundary

is indicated, the total system boundary is not shown in order to emphasise that there is no limit beyond which stakeholders cannot exist. Radiating around the centre the sectors of the web represent different perspectives or positions from which the centre can be viewed. These may represent functional departments within an organisation or they may represent wider constituencies.

The importance of the web is not in the exact labelling of sectors and boundaries but in seeing the web as a continuum. The sectors and labels shown in the examples should not be regarded as a prescriptive or a priori model for all webs, but by way of illustration, the groupings that have emerged from the case study research. The web should be viewed like a colour wheel with the different sectors representing degrees of similarity and recognising that there is no hard boundary between say, red and orange. The web is intended as a holistic view and rigid segregation of sectors and boundaries is thus an antithesis. The current positioning and grouping of stakeholders in Chapter Five for instance represents an arbitrary choice of the researcher's, and relates to: a) the documents reviewed and b) the interviews conducted. These items indicated which stakeholders had similar concerns due to their functional view of the Central Administration Systems and how close on a day-to-day basis these groups of stakeholders were to the systems under consideration (See Figure 6.5).

Figure 6.5 Internal Stakeholder Web for UofB (adapted from Coakes and Elliman 1997)



Thus for UofB the Student Data Team is placed on the Central Administration System as they use it on a daily basis and in the same web segment, Student Services are placed near the organisational boundary (indicated by the darker shading) as they require reports from the system but rarely access.

The positioning of stakeholders on segments and in proximity or otherwise to the target system should be discussed and reviewed during the process of refining the stakeholder constituency. It is acceptable that multiple perspectives of this wheel should emerge that may conflict in groupings and / or proximity, as multiple perspectives of the system under consideration will naturally emerge according to worldview. It is not required that these multiple perspectives should be combined into one total view as it would be unrealistic to expect agreement. The multiple viewpoints are valuable to indicate the many perspectives that will be necessary to take into consideration when developing any

new system plan. In particular, the use of a Stakeholder Web is recommended at a number of the Steps of the framework. Beginning at Step One, the web is developed iteratively, by planners and analysts, through a process of discovery with already known stakeholders. This process of discovery uses semi-structured interviews and a 'snowball' technique for further interviews and identification of stakeholders both within and outside the organisation. (See Chapter Four for discussion of how a corpus construction for interviews can be made). Web stakeholders are grouped according to function and relationship as confirmed in the interviews. They are not intended to represent a social network or to utilise actor network theory. They are intended to group people according to a value-free grouping of who interacts with whom and thus who could reasonably expect to represent whom. The web is repeated and amended in Steps Two, Three, and Four. It would be entirely reasonable for groups of stakeholders meeting to discuss the issues, outside of and alongside the formal interview and consultation process, to utilise stakeholder webs themselves as preparation for, and submission to, the SPIS process. There is no ownership attribute to any Stakeholder Web or Interaction Matrix and it would be a valuable part of the process to encourage self-use of these tools by the stakeholders as part of the reflection process prior to participation. In Step Five of the framework, webs are used as reference tools to ensure that when the strategy is re-drafted all the identified views are represented in the revised document. (In Coakes and Elliman 1999 we showed how webs for the case of UofA were drawn retrospectively and in addition, these webs were utilised in Chapter Five to indicate the development of the stories told.)

Given its focal point—the target CIS—the web diagram should remain otherwise value free. Unlike Clegg (1989) and Introna (1997) it does not depict power relationships or political alliances. Nor does it imply a particular problem situation as is found in rich picture models (Checkland, 1981; Avison & Wood-Harper, 1990). The web diagram is not intended to depict stakeholders from some judgmental position such as degrees of power, influence, or interest (Johnson & Scholes, 1999). In particular, care must be taken not to interpret distance from the central CIS as an indication of importance. Some of the most influential stakeholders may be remote from the organisation. This will be shown most clearly at Step One of the framework.

Examination of the web shows where gaps may exist. Sketching boundaries and identifying the resultant stakeholders requires sufficient knowledge of the organisation's objectives to suggest sectors of interest and boundaries within the community at large. Such factors as the organisational mission statement and its publicity material suggest the community groups at which it targets its activities and the image and priorities it wishes to portray. Stakeholders within the organisational boundary are significantly more accessible because the management infrastructure is in a position to brief such staff and define participation in the SPIS process as part of their responsibilities. Stakeholders outside the organisational boundary are relatively free agents able to set the terms of their participation (if they participate at all). This distinction between stakeholders is important when discussing the participation in the process but should not be used a reason for discounting stakeholders.

The Stakeholder Web is not an alternative to techniques such as Critical Systems Thinking (Flood & Jackson, 1991) or Participative Design (Hirschheim, 1983). Rather, awareness of the web by analysts and planners should inform the choice of participants in activities, thus improving the quality of the process. Identification of the stakeholders is a process of exploring the web plane looking for interested parties. Given its broad, value free picture of the influences and interests, it should help avoid ad hoc sampling of opinion on particular issues. Choosing for instance, representatives for consultative bodies means determining their terms of references and impacts the effectiveness and validity of these bodies. To choose stakeholders who must be consulted directly and those who can represent others, the web can be used as diagrammatic holistic vision of the organisation and the systems under review. It can indicate where gaps in stakeholder representation lie and thus improve consultative body representation. Used with the Interaction Matrix it will enable a body of workable size to be appointed, as the matrix will indicate where stakeholders can represent others' interests (Coakes and Elliman 1999). The distance from the centre may indicate the relevance of the stakeholder to the process under development and those farther away may only be concerned with some aspects of the proposal. Yet further away, particularly outside the organisational boundary, the target strategy tends to become one of a class and relevant only in so far as it can be seen to affect the organisation's ability to fulfil its role.

The Stakeholder Web can also be used as a reference model for testing coverage as well as forward planning in organisational activities. It can be used incrementally and combined, so that when strategically planning IS, parts of the plan can be looked at individually and then overlaid into a complete web plane. This assists in identifying relevant stakeholders at different times, in the planning process, and for different issues within it. Time may well be a factor in the relevance of stakeholding to the individuals concerned. The web plane will indicate how the organisation's perception of the planning process has shifted across time. Evolution and change is to be expected as was shown in Chapter Three and it cannot be expected that a full and complete set of stakeholders can be discovered at the beginning of the process, new stakeholders can be expected to be discovered throughout the process (Step Seven is implementation and begin again - a continuous cycle).

6.3.3 The Interaction Matrix

The framework also highlights the use of the Interaction Matrix (Coakes and Elliman, 1997; 2001), which is used to show existing (formal) communication links and commonalities of interest, between stakeholders, that enable the sharing of organisational knowledge and identifies where gaps might arise in the knowledge discovery process. The matrix is developed from the groups established in the web plane.

The Interaction Matrix also identifies where we might reasonably expect that, through existing communication links, stakeholders might represent the views of others. It is unlikely that all stakeholders identified can be consulted, in person, about the SPIS process and the strategy that it is devised or, that all identified are indeed interested in the strategy, other than in a very general way. For example organisations such as HESA in the University environment or the Department of Employment for both public and private organisations, are mainly concerned that the systems operated will provide them with their required information and statistics. How these are obtained is not their concern. Yet their demands influence heavily the type, quantity and quality, as well as functionality, of the systems that organisations must provide and implement, and thus their overall IS strategy. In a typical university the detailed knowledge of the requirements of bodies such as HESA would be held at middle and supervisory management and at

clerical levels, in such functional departments as the Student Records Office or the Registrar's Office. Senior management would typically, have only vague or undefined views of these requirements. Similarly, detailed knowledge of Department of Employment requirements would be held in the Human Resource or Personnel Departments and possibly also the Legal Department, generally at the same organisational levels as shown above. An example of stakeholder groupings and the Interaction Matrix is shown in Tables 6.1 and 6.2.

Table 6.1 Example Internal Stakeholder groups at UofB

(Coakes and Elliman 1997 p1066)

No.	Group	Consists of:
1.	TOP MANAGEMENT	Chancellor, Directors, Vice Chancellor, Governors, Management.
2.	TEACHING	Teaching Staff, Programme Assessment Boards, Subject Assessment Boards, Pathway Leaders, Lecturers, Pathway Teams: Lecturers.
3.	INFORMATION SYSTEMS	IS Director, IS Management, IS Development, IS Hardware And Operations, IS Support, MIS Department, User Broker.
4.	STUDENT SERVICES	Hardship Fund, Student Support, Student Union, Student Services, Student Data Team, Student Advice And Counselling,
5.	ASSOCIATED STAKEHOLDERS	Legal, Library, S* Training Company, Stakeholders of Related and Competing Systems.
6.	FINANCE	Accounting, Credit Control, Finance Committee, Finance Department, Management Accounts.
7.	ADMINISTRATION	Recruitment Team, Administrative Staff: Schools, Admissions Team, Registry Services: Director, Colleges: Postgraduate, Colleges: Undergraduate, Registry (including Student Records), Other Administration Departments.
8.	STUDENTS	Students

Table 6.2 Example Internal stakeholder group Interaction Matrix at UofB
(Coakes and Elliman 1997 p1066)

Links from:	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*
Links to: *1*	X		X		X	X		
2	X			X		X	X	X
3	X				X	X		
4	X	X				X	X	X
5	X		X	X		X	X	
6	X		X	X	X		X	X
7	X	X		X		X		X
8	X	X		X		X	X	

To produce an IM requires that stakeholders are first grouped into representative bodies as described above utilising the webs created. The web segments indicating where these groupings would most naturally fall. This is stage one of the creation of an IM (see Table 6.1 above). As the interviews and stakeholder consultations commence the knowledge required to be elicitated would also require understanding of who communicates with whom. Thus stage two of forming the IM can be completed. By the end of stage two, a view of which groups communicate with each other, whether at a local, micro level (functional for instance), or a macro (organisational) level, can be formed. The completion of the grid will also indicate that where no 'X' is found, no communication will also be found, or communication may be one-way only (eg top down) as shown in Table 6.2 above where communication from the VC goes one way only for most groups.

There are already in existence a number of methodologies that are designed to assist with the process of strategic IS planning, one of the best known being IBM's Business System

Planning (BSP) approach (IBM 1975). Whilst BSP addresses the issue from a viewpoint of organisational requirements and attempts to ensure the resulting plan aligns with business objectives, it derives its perspective by interviewing key executives about the environment, organisational plans, industry position etc. It also gathers information about current information systems. By limiting its external perspective to the viewpoints of senior management it demonstrates that argumentation step three (Chapter One) holds true. BSP has set out its systems boundaries in its methodology and identified its stakeholders, and in the case of universities for instance, has missed the retrieval of important knowledge. This limited view of the organisational stakeholders demonstrates that argumentation step four (Chapter One) also holds true, as strategy may be limited by its lack of knowledge and understanding of the internal and external environment. Note, this pre-setting of boundaries is also common in CIS development methodologies. And that this may also limit stakeholder participation. As argued above and in Chapters Two and Three, the limitation of stakeholder participation would also imply the limitation of the incorporation of stakeholder knowledge and thus important details can be missed. The proposed framework is thus intended to alleviate this issue.

Thus these Interaction Matrices and Stakeholder Webs are used in conjunction with each other through a process of action research and participatory techniques. The web being used as reference model for testing the coverage of the Interaction Matrix and the Matrix identifying entities in the web that are not communicated with and therefore where links will need to be established.

The researcher argues that use of the framework, due to its consultative and inclusive nature, shifts the organisational form towards more cross-functional working and collaborative working practices that are (more) typical of a network organisation with a flatter span of control. For the purposes of SPIS, it is argued, a more inclusive organisational form provides increased retrieval of stakeholder knowledge and therefore assists in setting more appropriate boundaries. These more appropriate boundaries thus alleviate issues raised by Earl's weaknesses.

6.4 Discussion of Framework Steps

Here is discussed in depth the characteristics of each step of the framework. Each step is characterised by its task; the major questions that are required to be asked at this step; the methods by which answers to these questions can be sought; and the possible techniques or tools that can be utilised within these methods.

These questions, macro methods and techniques may be expanded to include others also considered suitable by the organisation undertaking this process. They are not intended to be a comprehensive and fully inclusive set of questions, methods and tools but to provide a suitable, minimal selection for the purpose, including how and where to use the novel tools proposed. In this instance they were chosen from amongst those offered in the theory and literature as appearing to the researcher to be most relevant in the context of SPIS, and also through personal reflection on the process through teaching others. The evidence of weaknesses and limitations discovered in the process of SPIS in the case studies researched, as previously discussed in the thick descriptions, also indicated which areas of the process needed further enhancements. Section 6.5.1 below, describes how the SPIS Framework addresses these weaknesses. Each organisation's unique experience and culture may require the utilisation of additional (or fewer) questions, methods and techniques, and these can be found in the theory relating to generic strategic planning as well as perhaps, in theory and literature relating to system development. Whilst the framework does not require that all questions be answered in order to sufficiently complete the process of SPIS, it is suggested here, that the majority of questions as indicated in the Tables, are asked at the stages indicated. It is recommended that a suitable (to the organisation and its existing technology, structure and culture) Knowledge Base is created to collect, store and organise the data collected as the process progresses, in order that the answers to the questions posed, and the data retrieved during the searches, is stored in a format that can easily be searched and queried. A multi-media knowledge base would be recommended as sound and visual recordings can later be checked for verification of understanding and will alleviate the necessity for the production of complete transcriptions onto paper. Multi-media storage has two major advantages over paper documentation, first that no (unintentional or otherwise) bias is

introduced in the transcription and second it would be more time efficient. Stakeholders' tacit knowledge, externalised and made explicit, can thus be stored in text form and their tacit knowledge as retrieved during the interviews, can be stored as they express it, in video or audio format. This Knowledge Base will then be available for querying during the latter steps of the process as confirmation that the issues identified are fully covered. Macro methods and techniques are aligned to particular questions where this seems reasonable, or suggested for the whole process. Questions are divided into sections that are related to each other. Macro methods are distinguished from tools and techniques in the framework as a (macro) method is an (orderly) procedure with the techniques and tools (or skills) being the means by which this procedure can be accomplished.

It is important to note that whilst this framework is presented in a linear form it should be considered a continuous process and it may well be that several activities can or will be carried out at the same time, so that it may appear that cycles overlap or that they are not carried out consecutively. An overall important question to ponder is that of 'How do we measure and manage the evolution of our strategy?'

Step One

This is the step that encompasses the external environmental scan of an organisation. It is intended to place the strategic plan for IS in the context of the task and general environment. It is assumed that a generic organisational Strategic Plan has been developed utilising the standard planning tools and techniques such as Five Force analysis (Porter 1985) or PESTEL analysis (Johnson & Scholes 2002) and these are thus not discussed here. The role of the Strategic IS Plan is to support the generic organisational strategy and to achieve the business objectives identified. Before developing the IS plan therefore, it is necessary to ensure that suitable IS are chosen for the environment and the organisational tasks. Not all proposed IS may, for instance, fall within the correct regulatory or financial framework of control and thus searches for external stakeholders to consult are required. In Table 6.3 below is detailed this step of the framework.

Table 6.3 Framework Step One

Step Task	Question(s)	Method	Tools/Techniques
External scan: **environment and socio-technical view - task and general.**	Who has an interest in the IS strategy of the organisation? What are these interests? And what form do they take? How relevant to our SPIS are these interests? Should/must we consult/involve these stakeholders? Should/must we consider their requirements? What is mandatory upon us to do? And what advisory?	*Document scans e.g. sources of finance, sources of legal control; *Committee consultations - who are the committee in regular contact with? Who outside the committee influences the decisions made in that committee? *Intranet forums to allow internal stakeholders to post views; *Survey / questionnaire (internal); *Small group consultations of 'key' internal stakeholders; *1 to 1 interviews as appropriate.	*Text analysis scanning for key external stakeholders; *Stakeholder Webs as illustrations and to confirm coverage in the consultations; *BPR1 techniques in group consultations -e.g. 'post-it' boards, also mind-mapping (Coakes and Coakes, 1995a; 1995b); *Semi-structured interviews.

Important and new to this Step is the scan for external stakeholders within the task and general environment. The sociotechnical view taken of this stage of the process enlightens the understanding of the SPIS process within its context.

Step Two

This step has the task of discovering the internal stakeholders of the organisation undertaking SPIS. This is a time-consuming task and needs careful and methodical analysis in order that sufficient stakeholders are identified so that the boundaries of interest of the systems under consideration are appropriately drawn. As identified in earlier Chapters it is common to find that insufficient internal stakeholders are discovered and thus (or because) boundaries are drawn inappropriately and insufficient knowledge retrieved. This can contribute towards the ultimate failure of the system or indeed, of the planning process. The use of the novel tools – the Interaction Matrices and the

[1] Business Process Re-engineering

Stakeholder Webs - in this internal scan and also the external scan, permits of better checking of the stakeholder constituency for the planning process.

The framework here thus has the main question to ask of:

'Who are the major internal stakeholders of the current IS and of the proposed systems in the plan?'

The questions (including subsidiary), methods, tools and techniques for this step are detailed in Table 6.4 below.

Table 6.4 Framework Step Two

Step Task	Question	Method	Tools/Techniques
Internal scan: organisation.	Who are the main stakeholders in the current IS?	*As external scan; *Plus departmental/sectional meetings once prime users of IS have been identified; *Process analysis.	*As external; *Plus 'snowball' interviews (using a corpus construction as described in Chapter Four); *Social Network analysis to assist in discovering 'key' stakeholders and political players; *See Coakes and Lloyd-Jones (1997) for discussions on group behaviours.
	Who talks to whom externally?	*Document monitoring; *News monitoring; *Interviews.	*Interaction Matrices.
	Who talks to whom internally?	*Action research / ethnographic studies.	*Social Network analysis; *Interaction Matrices.
	Who internally talks to whom externally?	*Action research / ethnographic studies.	*Interaction Matrices.
	What systems currently exist? What systems are in the process of being developed? By whom? For what purpose? Should they form part of the strategic plan? Do they link with other systems? Should they link with other systems? If not, why not? Will they be superseded when the current IS plan is completed or by the proposed plan? What potential for (incremental) change do they have?	*Action research / ethnographic studies; *Interviews; *Audits.	*Integration of ethnography into the systems analysis and requirements elicitation processes (Coakes and Coakes 2000).

Methods by which these questions can be answered include all the methods utilised by the external scan plus the additional methods identified in the table. In particular the use of Stakeholder Webs to develop a holistic view of the IS under consideration and the

Interaction Matrices to help answer the question 'Who talks to whom?' These tools provide easy to understand visual representations of a complex situation. They can be used without prior learning and little explanation during the consultation process and developed with stakeholders to place other stakeholders in their appropriate position in relation to the IS. Stakeholders can be encouraged to draw rough links and diagrams themselves and to amend the pre-prepared diagrams as required.

It is important to note here that groups when consulted will behave in a political manner and that these behaviours need to be considered when undertaking departmental or section meetings. A discussion of how this affects group behaviour can be found in Brown (1988) and Coakes and Lloyd-Jones (1997). The use of individual interviews may alleviate this issue. It is also important to understand that the use of ethnographic interview techniques in this SPIS context is recommended to permit of full and complete story-telling by the interviewees unlimited by the interviewer's preconceptions of what they wish to know. It should be noted that each story that is told by the interviewees will be coloured by their own context and bias and thus will not be value-free. The interviewers must take this into account when transcribing the interviews afterwards. It may be helpful to use a software program (such as the Document Indexer described in Chapter Four) to analyse these interviews for key ideas and issues. This should also bring out conflicts in requirements and meanings that will need further clarification and amelioration. In Chapter Two is discussed some issues with meanings of words and phrases, for as Rosenberg (2000) says 'Conversations are regarded as a primary mode of communication' and speakers and listeners collaboratively establish their common perspective on the communicative situation. Those who participate actively in a conversation will understand very differently from those who do not and thus those who tell their story will (most likely) be active rather than passive informants (see also discussions by Clarke *1992* and *1996*).

Techniques for the ranking of projects etc are described in Step Three below.

Step Three

In Step Three the task is to draw up the first draft strategy for IS. Whilst this will be returned to again in Step Five after the IT strategy is reviewed, there may well be several versions of this draft document. The cycle between Steps Three, Four and Five additionally are iterative and may well be completed several times.

The SPIS Framework gives a structure that can challenge existing paradigms. These challenges do not necessarily come from a within a small circle of known stakeholders and should not therefore be dismissed because they come from an unusual source or a different organisational level. However, it should be noted that there should not be innovation for innovation's sake – it should be undertaken for positive reasons and what is turned down should be justified. This Step of the framework provides the opportunity for true consultation rather than a briefing of stakeholders and should not be performed through the auspices of such events as road shows but rather through interviews and small group consultations as described, as well as consulting (internal and external) entrepreneurs and visionaries. This provides a supportive atmosphere for the process of innovation.

There are many questions that need to be asked at this Step in the process and it is not possible to list all of them here, however a sample of the more important questions is shown in Table 6.5.

Table 6.5 Framework Step Three

Step Task	Questions	Methods	Tools/Techniques
First draft IS strategy.	How close is this to our business/organisational strategy? Is it aligned with our business goals? Information management requirements? Organisational structure? What realignment of our organisation and current procedures will it require? What projects do we need to implement? In which order? By when? Does this provide the stakeholders with what they want/need? Is our strategy viable technologically? How close are we to leading edge technology? What are the technological opportunities? How much of a risk would it be to implement new technology? How much of a risk would it be not to implement new technology? Where are our strengths and weaknesses? In terms of skills, capabilities, technologies etc? What are our key competences and strengths of knowledge? How can we support innovation? What Human Resource Management strategies do we need to support our new organisational and IS strategies? What are the current best practices in these areas?	*Committee consultations; *Intranet forums; *Survey / questionnaire (internal); *Small group consultations; *1 to 1 interviews with entrepreneurs and visionaries (internal and external); *Environment scanning.	*Stakeholder webs; *Rating techniques including Delphi methods (Land, 1999); *Ranking techniques including Q-sorts (Brown,1996; Gottschalk, 2001); *Standard strategy techniques such as MOST[2], SWOT[3], Earl's 3-pronged model (1987), SPACE[4], portfolio analysis etc; *Scenario planning (Gertner, 1999; Hunger and Wheeler, 2000); *Brainstorming sessions with other staff and visionaries.

[2] Mission, Objectives, Strategy, Tactics

[3] Strength, Weaknesses, Opportunities, Threats

[4] Strategic Position and ACtion Evaluation

Step Task	Questions	Methods	Tools/Techniques
	What are our opportunities for competitive advantage?		
	What new value propositions can it provide?		
	What can we do better?		
	How do we change the nature of our products and services?		
	What can we do more?		
	How do we uncover new types of business opportunities?		
	What are the benefits to us? To our stakeholders? To our customers/clients?		
	What new can we do?		
	What timing is best?		
	What is the level of uncertainty in the external environment that we need to consider? And thus the level of risk?		
	How do we implement the strategy? How do we incorporate new systems with existing legacy systems?		
	What approach should we take in relation to development? Is outsourcing appropriate?		
	How will we measure success?		
	How will we manage change? And resistance to change?		

The techniques and tools suggested for Step Three include the use of Stakeholder Webs to confirm that the necessary stakeholders have been considered. However, it is important to note that mere coverage of the relevant stakeholders as per the suggestions of other stakeholders may be insufficient. Stakeholders of the SPIS process may be excluded by others - for power and influence reasons for instance. The webs drawn should indicate the constituencies that need to be consulted and thus should indicate

where coverage is incomplete. Thus the corpus construction for interviews and group meetings must make reference to the webs to complete the necessary coverage.

In addition, it should be noted that there may well not be agreement for a variety of reasons, about which projects are most important or in which order they should be implemented, let alone what should be included in each project. Therefore the following techniques are suggested to enable some type of agreement to be reached:

Ranking techniques including the Delphi methods (see Land, 1999 for further details of this may be used);

Rating techniques, which could include Q-Sorts which provides consensus through multiple rounds (Brown, 1996; Gottschalk, 2001);

Scenario planning (Gertner, 1999; Hunger and Wheeler, 2000), which is based on game theory and assesses the possible outcomes of all actions against the possible moves of opponents.

To complete the IS strategy formulation it would also be necessary to ensure that blueprints for data, information and applications are completed and that goals and Critical Success Factors, as well as user requirements for information and functionality are aligned. Information management is extremely important to consider when planning the systems that will perform this management. The systems should follow from the information required rather than vice versa.

Once the first draft IS strategy is completed and has been iterated and reviewed as many times as required through consultation with key stakeholders (identified through the Stakeholder Web, Interaction Matrices and if required social network analysis), then it is possible to proceed to the next step, which reviews IT strategy.

Step Four

Step Four is concerned with IT strategy. Having identified the relevant IS for the way forward in Step Three, the organisation will now need to identify appropriate and sufficient technology to underpin the required IS and provide it with the necessary

functionality. The IT strategy will also need to consider the potential future requirements of the organisation and the potential developments in technology that might impact on what technology should now be considered. IT strategy has three major questions to answer:

'What are the external influences on IT strategy?'

'What are the internal constraints on IT strategy?'

'What are the resources that we will need to carry out the proposed IS strategy?'

In Table 6.6 below is detailed the methods, tools and techniques by which these questions can be answered.

Table 6.6 Framework Step Four

Step Task	Questions	Methods	Tools/Techniques
Review IT strategy.	What are the external influences on IT strategy? What are the internal constraints on IT strategy? What are the resources that we will need to carry out the proposed IS strategy? What are the potential developments in technology that we should now consider? What are the risks associated with the (chosen) technology? Or potential?	*Document analysis; *Scanning of governmental briefings/papers; *Technology news; *WWW[5] search; *Other grey literature[6]; *Competitor analysis; *Internal interviews; *Group consultations; *Internal document analysis.	*Stakeholder Webs; *Traditional strategic analysis modelse.g.5-force models; *Strategic scenario planning (Hunger and Wheeler 2000).

In order to answer these questions an external and internal audit need to be performed. These audits may need the use of a number tools. Suggested here would again be the Stakeholder Webs to discover external stakeholder influences; traditional strategic analysis models such as Porter's Five Forces (1985), and again Scenario Planning.

[5] World Wide Web

[6] grey' literature is usually defined as literature that is not normally available through recognised sources such as libraries

Step Five

Step Five reviews the IS strategy in the light of the internal and external IT scan and amends it as necessary. Here the major questions are:

'Is the strategy viable?'

'What do we need to change?'

'What must we change?'

'How do we achieve the required results under the constraints the audits have shown us?'

'What is our plan for implementation?'

The answers to these questions are developed through combinations of scenario planning and consultations of the relevant major stakeholders both individually and in small groups. Table 6.7 indicates the questions and methods utilised in this task.

Table 6.7 Step Five

Step Task	Questions	Methods	Tools/Techniques
Review IS Strategy.	Is the strategy viable? What do we need to change? What must we change? How do we achieve the results required under our constraints? What are the CSFs that we must achieve in order that the plan progresses satisfactorily? What is our plan for implementation? What is the optimal plan? And what the most likely outcome given our constraints? What further resources do we need and how soon? How do we obtain these resources? What are the constraints on obtaining these resources?	*Group consultations; *Focus groups; *Interviews; *Document comparisons (from Step Four).	*Stakeholder Webs; *Scenario Planning.

Step Six

Step Six is to revise and redraft the strategy ensuring that the four major components of people, organisation, technology and environment (the sociotechnical overview) are fully covered before proceeding to Step 7.

The prime questions therefore are 'Have we covered the:

People issues?'

Organisational issues?'

Technology issues?'

Environment issues?'

It is thus a task primarily for the IS, IT and IM (information management) strategy planners to jointly undertake but the strategy formulation committee should also be involved. It requires careful cross-checking with the findings from the previous five steps through querying the Knowledge Base. The main questions and methods for this step are detailed in Table 6.8

Table 6.8 Step Six

Step Task	Questions	Methods	Tools/Techniques
Revise and redraft the strategy.	Have we covered the people issues? Have we covered the organisational issues? Have we covered the technology issues? Have we covered the environmental issues? Are the information management issues for people, organisation and environment fully covered? Do we believe that the plan produced for development and implementation of the proposed systems is viable? Reasonable? Doable? Have we consulted everyone who should be / needs to be consulted? Are the information systems we are proposing consistent with the requirements of the scenarios proposed?	*Consultation; *Scanning and querying the Knowledge Base.	*Focus groups with stakeholder representatives; *BPR techniques in group consultations (see Step One).

Step Seven

This is Implementation, Reflection and Renewal. This Step should again be led by the IS, IT and IM strategy planners. The reflection and renewal segues seamlessly into Step One – begin again - through virtue of the questions asked - a cyclical process. The main question therefore to be asked is:

'Were we right?'

A learning organisation will reflect and renew and therefore may require formal education in the processes involved in strategy formulation and / or external consultation to assist in the reflection process and this is indicated in Table 6.9 along with the main questions, methods and tools.

Table 6.9 Step Seven

Step Task	Questions	Methods	Tools/Techniques
Reflection and Renewal.	Were we right? Did we get it right? What more could / should we have done? What could / should we have done better? What did we miss? And why? How do we ensure that we don't miss (it) next time? Did we ask the right questions? Did the order / plan for the systems and implementation answer the information (management) needs of the organisation? If not why not? What went well and what went badly? Do we know why? How can we ensure for the future that we do better? What lessons have we learnt?	*Focus groups with stakeholder representatives; *Brainstorming sessions; *Reflection days for the committee; *Reflection days for the management and strategic planners (including IS and IT); *Total Systems Interventions (Phase One – Creativity - Flood 1995).	*External consultant to assist in reflection and renewal process and to review past performance; *Facilitator for the reflection sessions; *Total Systems Interventions (Phase One – Creativity - Flood 1995); *Exit interviews with project managers.

6.5 How the Framework would Alleviate the Weaknesses Identified.

Lack of stakeholder involvement is a serious issue. Without full involvement of sufficient stakeholders as has been argued, there will be insufficient knowledge or understanding about the wider implications of systems and the true system boundaries will not be retrieved. In this study stakeholders are identified as being either driver or influencers and it is incumbent upon the SPIS process to note these two types and to ensure that they are represented in the process.

The documentation that came out of the UofA committee in particular, reveals the concerns of stakeholders influencing the committee. Some of the stakeholders, both internal and external, can be characterised as drivers because they directly influenced the decisions of the committee. Others can be characterised as influencers because they indirectly affected the activities by being considered when decisions have been taken.

Many of these external stakeholders are governmental bodies (such as the University Clearing and Admissions System, and HESA for the case studies discussed) whose needs for the supply of data and reports are an integral requirement of any university's student record keeping package. These stakeholders are classified as drivers because the university must supply data and reports as specified by these agencies. Other external bodies such as JISC were in constant touch with the UofA committee through key members and many JISC papers were considered at the committee meetings, issues raised and discussed and thus can be considered influencers. Identification of these driver and influencer stakeholders is one of the prime motivations for use of the Stakeholder Web and the Interaction Matrix within the framework.

Below is discussed Earl's identified weaknesses for the Administrative organisational form and it is also shown how the SPIS Framework would alleviate each weakness.

6.5.1 Weakness One - No Application can be Developed until it is 'On the Plan'

The framework would address this issue of failure to acknowledge interconnectedness of SPIS activities through its cycle of continuous process review. Although implementation is only scheduled at Step Seven, the repetitive nature of the SPIS Framework means some implementation or adaptation is always being undertaken. It is assumed that there is always at least a form of IS planning being undertaken in any organisation, but the adoption of the framework would strengthen and adjust this process. Interconnectedness of systems should be discovered through the process of stakeholder consultations and the interviews conducted to determine their perspectives. The development of webs and matrices would assist in discovering the representative stakeholders and would ensure that necessary consultation and participation takes place.

In the case studies described in Chapter Five we can see that in UofA a number of departments were frustrated by the need to wait until the plan was completed and ratified before acquiring the systems that they felt necessary. So much so that some systems were developed through 'executive action' and were later subsumed into the central suite (the Alumni database and the Research database for instance) or were maintained as separate systems (the timetabling system for example) because they were not supplied by the central suite in a suitable form. The sponsors of these systems were concerned about the time lag between systems proposals and implementation and felt that they could not wait. In UofB we find that incremental system development was undertaken for some systems as there was no real evidence of SPIS being undertaken in any coherent way. This of course, led to a number of issues and difficulties with the systems and the systems integration as important activities were not undertaken by the organisation to ensure that the systems implemented were fit for purpose.

Early identification of driver and influencer stakeholders can assist with putting applications 'on the plan' more quickly as internal politics are then less likely to influence decisions when valid consultation and participation takes place. In addition, full knowledge of stakeholders' needs alleviates the necessity to re-draw the specification documents due to missing or incomplete requirements.

A large SPIS process inevitably takes time to complete the cycle and the activities suggested in the framework are time consuming to undertake. However the framework suggests that the organisation does not wait until the SPIS cycle is complete but that as this cycle should be continuous, the organisation will always be in the process of implementing Step Seven as well as Step One for example. It specifically states in Section 6.3.1 that it would be unreasonable to expect system development to wait but that any system will need to be considered in the light of the (final) strategy and thus may need to be discarded or adapted.

6.5.2 Weakness Two - Ideas for Radical Change are Not Identified and the Adoption of New Strategic Enterprise-Level Applications is Rare.

The framework assists with review of current applications at Step Three by asking questions that should generate suggestions for innovation and new directions as well as enhancement of existing systems. These questions are highlighted in the framework and some techniques that can help decide whether a step-change would be appropriate are suggested. The consultative and participative approach suggested by the framework mitigates remote decision-making.

In both case studies detailed in Chapter Five we see the lack of radical change engendered by the organisational attitude to planning. The complications of going through many levels of committee decision-making (as described above) taken for the completion of the planning process, means that it is difficult to undertake radical change as each committee will be likely to 'soften' the idea due to concerns over the risk of taking radical steps. The framework as argued above, ensures that there is a single committee who holds the full responsibility (including the necessary financial and budgetary control) as well as representatives of the complete stakeholder community that will permit it to engender radical change with full consultation from the beginning. Strategic level enterprise applications need to be considered in the light of the full implication and can only be so considered if representatives from across this full spectrum, including driver and influencer stakeholders, are involved in the decision-making process. This is a basic sociotechnical argument - that those who are not consulted or who do not participate - may not abide by the decisions that are made for them.

In the case studies we see that neither organisation considered a strategic level enterprise and what was implemented at UofA was a system at process level rather than strategic level. A strategic level application would be likely to be utilised for such purposes as positioning the organisation for surprise - in a manner which will surprise competitors; or would shift the rules of competition though finding a new way to serve the organisation's customers and which might therefore transform the industry; or might be used for positioning the organisation for speed in reaction to the environment for instance (D'Aveni, 1994). The case studies illustrate that such systems are radical in conception

and thus are difficult to devise and to drive through a committee hierarchy. The framework proposed would enable such systems to be discovered through the use of interviews and consultations with entrepreneurial and visionary staff (and external consultants where appropriate).

6.5.3 Weakness Three - Claims about Power Plays and Political Influences are Common

To be effective in this respect the framework needs to be adopted at all levels. Even if in UofA, the ISSG had tried to apply the framework unilaterally the existing power relationship between it and the informal SEG could have nullified most of its impact. The case of UofB illustrates the issue of power plays and political influences very clearly. In both cases the nature of the planning cycle and the involvement of those most affected were limited by the way the planning processes were performed.

Power and political plays are common where resources are limited and there is conflict over their allocation. A consensual method of choosing resource allocation would alleviate some (it is difficult to claim all) of intra-organisational political activities. Resources will still be limited when using the framework but there would be inclusivity of relevant stakeholders (included here are the internal drivers and influencers) in the allocation process and transparency of process and thus less likelihood of internal strife.

In addition, the wider constituency of the framework's stakeholders would make it more difficult to ignore the knowledge held about the environment within and without the organisation at whatever level the proposed strategy is considered. A weight of opinion must influence decisions to some degree. However, it is impossible to completely remove power plays and politics in an organisation, it can only be alleviated. The inclusivity of the activities that are an integral part of the knowledge discovery in the framework is intended to breakdown some information 'gate keeping' activities. A more consensual style of management and participative organisational form, which would result from application of the proposed framework, also means that such alleviation could take place. It is argued in Munkvold (2000) that only the sociotechnical approach - advocated here - involves real empowerment of the organisational members through establishing

work processes where employees have direct control. Pava (1986) also suggests that sociotechnical design enables improvements to be self-designed and thus able to match organisations with their technology in a dynamic environment.

6.5.4 Weakness Four - The Procedure is Essentially Such That an Organisation Focuses on Resource-Allocation Processes

In a typical bureaucratic organisation lack of power to set budgets is common of many lower-level committees. Central control of finance is prized highly in most bureaucracies. The SPIS Framework would address the issues of budgets by initially asking the first draft strategy questions. Also Steps Four, Five and Six occur before implementation and therefore budgets set should be flexible before Step Five. In particular, at Step Four the resources issue is addressed and then reviewed at Step Five. Due to the iterative nature of the SPIS Framework activities budgets cannot be ever considered final and complete, but rather a 'moveable feast' that is constantly being adjusted as events occur that influence strategy development.

In addition, the framework insists that the decision-making body is a single committee with not only full project choice responsibility, but also full financial responsibility with budgets that are only limited by an overall organisational strategic plan. It would thus require that the organisation's Financial Director or equivalent sits on this committee and that there is no 'higher' body to which decisions may need to be referred. There is still bound to be some issues relating to resource allocation as with all organisations resources are finite and there will be conflicting demands on those available. Few organisations can afford to develop all the systems that in an ideal world they would like. It should also be required by the strategy committee that costs and benefits be weighed up in a more than strictly numerical manner and it is suggested that use of such techniques as Information Economics (Parker, Trainor and Benson, 1989) be utilised to help calculate value to the organisation. Additionally some of the innovative techniques now being suggested for measuring the worth of Intellectual Capital to an organisation could also be utilised (Coakes, Sugden and Bradburn, 2002).

6.5.5 Endemic Inertia

The framework mitigates this weakness of endemic inertia by expecting that (potentially short-term) developments will occur during the planning process as a result of the continuous consultation with both internal and external stakeholders that characterises the process. Development is seen as a constant in the organisation. In the case of UofB this would have meant (provided there was devolution of power and finance as described) that more than minor adjustments to the SRS could have been undertaken and integration as required with other systems could have been undertaken. The problem of data quality (or lack of it) could thus have been addressed at source as integrated systems would have been more secure in terms of verification of accuracy. In the case of UofA we would have expected to see a significant increase in the speed in which the projects were undertaken and implemented as there would have been significant delayering and devolvement of decision-making. This would also have applied to UofB.

This characteristic of endemic inertia is currently causing difficulties in many universities where they are now being forced to operate in a relatively unstable environment where traditional boundaries are being broken down. The wide body of stakeholders, in the form of Government and students, are demanding a greater say in the standards and content of the higher education system. Their general inability to respond is further hampered by a lack of responsiveness in IS planning processes. The framework's insistence on the de-layering of the decision-making structure and the devolvement of power to make decisions to a single body will assist in shortening the decision-making life cycle. In addition, as developments are seen as occurring during the overall cycle and then being brought into the strategic fold later, it would be highly appropriate for the planning committee to devolve some power and finance directly to each department so that minor projects can be undertaken whilst the larger process is ongoing. The departments would need to be represented on the committee and thus would be fully aware of the overall SPIS direction. As both internal and external stakeholders will be represented on the committee (by proxy if necessary) there is the potential for sub-committees for particular systems to form, provided they are given devolved responsibility and finance so that their decisions can be implemented without going back upwards.

6.6 Discussion – use of the Framework Tools and Mitigation of Insufficiencies

In this and the previous Chapter it was shown how organisational goals provide a reference view of the interests', in the Universities studied, activities in general, and the development of their information systems in particular. Comparison with the webs of actual stakeholder representation clearly indicated gaps in the relevant classes and groups of stakeholders, enabling us to forecast shortfalls within the strategic planning activities.

The webs and analysis of the Universities' missions verified the theoretical perspective that important stakeholders lie beyond the organisational boundary, in its changing external environment. In examining the work of the UofA steering committee, instances where representative members of large groups successfully managed stakeholders' interests were identified. The UofA committee papers also identified several external organisations with a legitimate interest. There was evidence of representation by proxy but this representation was largely ad hoc. For example, the lack of explicit notions of potential students or the interface to partner colleges suggests the representation in UofA was not always consistent.

It was clearly shown that, although a CIS is usually perceived to lie within an organisation, the relevant interests are much wider. In particular, the organisation's formal boundaries are unrelated to the human system that affects, or is affected by, the CISs within the strategic plan.

It is evident from some of the activities of the members of the committees and members of the universities not sitting on the committees, especially in UofB, that we must always take into account the issues of power, politics, resistance and influence within the organisation, the Payroll system in UofA being a specific example. See discussions by Handy (1981); Markus (1983); Davenport, Eccles and Prusak (1992); Morgan (1997); Silva, Dhillon, and Backhouse (1997); relating to power and politics in organisations, especially in relation to information systems, for: ' power influences who gets what, when and how' (Morgan, 1997 p170). Resistance to change and a desire to keep control of the decision meant that the Payroll Department in UofA maintained use of their legacy

system and successfully ensured, during the consultation phase, that any decision on what system they should use was delayed. It is also possible to see the activities of the finance working group in UofA as delaying tactics, to again maintain control of the situation and thus power and influence.

The author thus has shown that the expected boundaries of the normal planning processes in the case study organisations were inaccurate and that the stakeholders (and thus the knowledge that they hold) included in the planning process were insufficient. It has also been shown that the typical weaknesses displayed by their organisational form held true for the case study organisations and that the framework proposed would alleviate these weaknesses as well as both widen the boundary and ensure sufficient inclusivity of stakeholders. As argued in Section 6.2.1 the use of the SPIS Framework and its tools, as a result of its inclusive, consultative and participative mode for undertaking SPIS, shifts the organisation away from the Administrative mode of control. A less 'formal' span of organisational control encourages cross-functional and collaborative working and the better retrieval of organisational knowledge, whilst reducing the effects of power plays and resource influencing by interested parties. Information gatekeeping becomes less easy to perform. We also therefore see more fluid organisational boundaries and a better ability of the organisation to understand the complex environment it inhabits.

6.7 Conclusion

This chapter illustrated the role of stakeholders in driving development and change within organisations. The study presented the SPIS Framework for improving the sufficiency of the planning process.

The debate that choosing representatives for consultative bodies and determining their terms of references impacts the effectiveness and validity of the decisions made by these bodies, was noted. To choose stakeholders who must be consulted directly and those who can represent others, the Stakeholder Web can be used as a diagrammatic holistic vision of the organisation and the systems under review. The web should be drafted at an early stage in the formation of the consultative body and can, through use of the themes

identified and iterations of the web itself, indicate where gaps in stakeholders exist and improve the representation in the committee. Since the business environment is continually changing, monitoring a review of the stakeholder constituency and its representation should be a routine task. Throughout, the balance between a complete view of stakeholder interests and a body of workable size needs to be carefully considered and maintained.

The web is also a useful tool when considering wider consultative actions in relation to particular activities and / or projects. Lessons relating to the development of new strategic information systems, whilst legacy systems are still extant, can also be drawn. Legacy systems will always have both detractors and proponents, usually close to the system. When deciding whether to replace or amend such systems it is necessary to ensure that the wider stakeholder interests are fully represented in the decision making process, so that a balanced view can be taken. The web can assist in this endeavour by indicating the necessary composition of the consultative body.

In this chapter it has been shown, through the cases discussed, that current methods of SPIS, and stakeholder discovery, produce unrepresentative lists of stakeholders and unacceptably narrow system boundaries. The typology of planning approaches that were discovered by Earl in his paper of 1993 was discussed, showing that these approaches result in a plan that contains insufficient knowledge about the organisation and its environment. Such plans lack the potential to deliver a realistic assessment of the proposed strategy and the resulting systems implementations. In the cases discussed, UofA and UofB were analysed through Earl's typology of SPIS approaches. Having been identified as Administrative from their orientation they were also seen to demonstrate some of the typical weaknesses of this planning type. Through the framework and its range of tools and techniques it was shown that the weakness of this planning approach can be alleviated and that the five arguments initially proposed in Chapter One can be at least partially nullified. Arguments six and seven indicate where the SPIS Framework is of particular use and importance. However, UofA and UofB do not have a pure Administrative approach to planning and neither are the arguments in support of the SPIS Framework specific to an Administrative approach. Thus the author believes there

is good reason to expect the advantages of the SPIS Framework to hold regardless of original organisational form. This is taken up further in Chapter Seven.

CHAPTER SEVEN:

Conclusions and Further Research Directions

7.0 Overview of the Research

The thesis proposed that Strategic Planning for Information Systems (SPIS) has become ineffective through a tendency to focus on the information technologies involved. The thesis argued that the dominant rational, reductionist epistemology of SPIS methods, tools and techniques limits the effectiveness of SPIS through methodological impoverishment. The thesis thus proposed that a humanistic, sociotechnical perspective of SPIS accommodates the use of complementary tools and techniques that improve the process. It was argued from a sociotechnical point of view, that systems' boundaries and the knowledge encompassed within these boundaries are typically too narrow for a successful SPIS process. This sociotechnical point of view was enlightened by Cherns' principles (1987), in particular by Principle 5, which states expressly that boundaries must be chosen with care, and that these boundaries should not inhibit the sharing of information, knowledge and skills (Lehr, 1992).

An emancipatory information systems research programme (Klein and Hirschheim, 1987) was used to advance a framework that overcomes the insufficiency and inadequacy of the process of strategic planning for information systems in organisations that permits information systems to fail. The framework was tested on two organisations. The case research investigated the role of stakeholders, knowledge, and boundaries in the process of SPIS in order to develop more sufficient methods for the process of SPIS that address the perceived inadequacies in current processes, and thus provide an improved strategic planning process for information systems. Two novel tools were introduced: the Stakeholder Web and the Interaction Matrix. Their evolution was a major contribution of this research.

The framework fills the perceived lack of relevant theory in SPIS by underpinning the proposed tools with a comprehensive review of literature and theory to demonstrate their value. The tools and the framework address the perceived delays and the excessive time

taken to complete the process of SPIS by recognising the continuous nature of planning and proposing a process that also permits of recognition of the lack of stability in the external organisational environment. The organisation when utilising this SPIS Framework can be assured that through the use of the tools suggested, the best available knowledge and understanding of the environment, both internal and external is being used, and that systems developed and implemented under this framework will be the most optimal fit to the environment that is possible. This collection of tools thus presents a practical research contribution that is not found in any other methodology for SPIS.

In addition, a new definition for the term 'stakeholder' was formulated from an extensive literature and theory survey and was used to supply clarity in understanding for the purpose of this study and this would provide a useful definition for further work within the field of IS.

A theoretical contribution is also claimed, by extending traditional sociotechnical thinking and, in addition, a methodological contribution, by demonstrating that the Stakeholder Web is also applicable as a research tool.

Below is reviewed the contents of each chapter detailing the main points of each.

Chapter One

In Chapter One the process of SPIS was evaluated with a sociotechnical perspective and a number of issues relating to change initiatives were identified that would be involved in the process of implementing new information systems. Joint optimisation of both people and technology in these initiatives seem rare and many such initiatives fail to encompass a wider community of stakeholders than those suggested in existing SPIS methodologies, and thus often fail to achieve a balanced view.

A number of issues with existing methodologies for such planning were identified in Chapter One; in particular the issue of the technological approach was identified as a major problem within many methodologies. The sociotechnical view would balance this Weltanschauung with that of the social world and thus alleviates the many issues raised by

authors who criticise this approach. Organisational implications and interactions are often not fully recognised in these methodologies and it has become apparent, through the many studies of system failures that are quoted in the literature, that it is often the human issues that are neglected.

Organisational culture was shown to be an influencer of the SPIS methodology utilised and inherent in many such cultures and methodologies were a number of weaknesses. These weaknesses were identified in particular by Earl (1993), and Lederer and Sethi (1988); whilst Earl identified cultural weaknesses according to organisational structure, the cultural weaknesses identified by Lederer & Sethi were more generic and consisted of such things as the inability to sustain top level management commitment, dependency on the IT leader for direction, and difficulties with leadership of teams etc.

Chapter One thus proposed five argumentation steps that underpinned the research agenda and theory development.. This argument was drawn from the study's objectives to undertake investigation into the perceived failure of many SPIS processes in organisations.

The choice of boundary location for systems and strategy is clearly crucial, as it delineates who is within or without the sphere of influence of either the strategy or project. Thus it influences the choice of stakeholders who may be consulted with. The wrong boundary location and insufficient stakeholders are involved; inappropriate stakeholders are chosen for consultation and stakeholders are insufficiently involved in either the strategy or the project.

The study's objectives were identified and a number of questions were raised in Chapter One that, in subsequent chapters, were explored and some attempts at explanations were derived from the theoretical literature review and the data analysis performed. The main question for this research project was identified as:

What is the insufficiency or inadequacy of the process of strategic planning for information systems in organisations that permits failed or never implemented systems?

The project therefore was designed to answer this major question through the means of exploratory research, and the development of an outline schema (framework) to improve the processes involved in SPIS and thus alleviate the potentiality of failed or never implemented systems.

Chapter Two

The role of stakeholders in the planning process was identified as crucial in Chapter One and in Chapter Two, from an extensive literature survey across a number of fields, the meaning and usage of the word 'stakeholder' was explored. A new definition of the word was then formulated for use within this study:

A person who has an interest in a CIS/SPIS development in anticipation of (in expectation of) the possible future outcomes of that development.

This definition was not offered in opposition to any major definitions in either the organisational or managerial fields of study, but was intended to supply a clarity and specificity to the situation that enabled the context or domain to influence the meaning. It was argued that it is essential that we understand the meanings of the words we use in their specified context in order to prevent misunderstanding and conflict.

This chapter discussed the origins of the word stakeholder and the development of the theory of stakeholding from a number of perspectives. It reviewed the traditional theory of stakeholding and contrasted it with modern and postmodernist theory where stakeholding is related to 'enabling' in order to generate interdependence and shared control over concerns and co-operative ways of doing. This postmodernist (and feminist) view of stakeholder theory aligns with Earl's view that the Organisational form is best suited to successful SPIS as it is a continuous decision-making activity shared by the business and IS, in an emergent and consensual manner. It also conforms to the sociotechnical ethics where power should be devolved to those who require the authority to complete their work, where organisations should be fluid and adaptable to change – transitional - and there should be a high degree of independence and self-management of tasks.

Chapter Three

In Chapter Three the literature was explored for the external and internal context within which IS are strategically planned. A number of specific areas were taken as relevant to this exploration, in particular knowledge management and systems theory, and the idea of the complex environment, were used to examine the interplay of events that might affect the planning process.

The turbulent environment of organisations was investigated in the literature in the context of bounded realities and managerial mindsets. This was illumined by a discussion of the sources of predictable and unpredictable behaviour in the organisational environment.

Chapter Three argued that without sufficient knowledge from organisational stakeholders the organisational fit to the landscape (internal and external, political, legal, social and economic) will not be optimal and thus any plans developed will be insufficient and possibly inflexible in the context. It was argued that a learning organisation would be better able to respond to a time of complexity and turbulence and that pre-set agendas and preconceived boundaries were inimical to the concept of an organisation that learns.

The known or set boundaries of a system, or organisation, limit where knowledge may reside – a boundary that encompasses insufficient knowledge of the landscape's environment will limit the strategy formed as a result. Many existing methodologies for SPIS (as discussed in Chapter One) set boundaries for knowledge retrieval that are limited, often to the technological system boundary. An insufficient boundary leads to insufficient consultation with stakeholders and thus inappropriate or incomplete knowledge will be retrieved to illuminate the planning process and a less fit plan may be chosen.

Chapter Four

Chapter Four contains the details of the research methods used within this study. It argues for a trans-paradigmatic approach to the exploratory research and explanatory case studies, as being the most appropriate method to study the phenomenon of SPIS in

practice. Real-world situations are complex and multi-dimensional and need to be explored through methodology combination in order to fully grasp the environment, both within, and without, as well as over time. The research was triangulated across time and methodological applications in order to maintain the principle of suspicion and across two case studies to attempt to achieve generalisability of the findings.

A subjective and interpretative approach was taken and grounded data analysis was utilised through a holistic (sociotechnical) perspective thus performing a hermeneutic circle.

The data collected for the case studies were analysed utilising a specially programmed Document Indexer. The Document Indexer was utilised to assist in the first two stages of grounded data analysis – open coding and axial coding. The final stage – selective coding – was performed through the organisational stories told in Chapter Five. The methods of data collection for the two case studies were different and varied. In Chapter Four the methods are discussed in depth through the seven stages of the research process (Strauss and Corbin 1990). The corpus construction of the interviews used later to write narratives for UofB is described, as well as how the textual case evidence was collected for both cases.

The issue of reflexivity is commented on by a number of writers in the study of research methods (Marcus 1994, Holstein & Gubrium 1994, Smyth & Shacklock 1998; Holliday 2002). It acknowledges that qualitative researchers are 'entangled' with the social world they study and that, as Holliday says, researchers must need come to terms with, and capitalise on, the complexities of their presence in the research setting. Research cannot eliminate the effect of the researcher, and it has been said that "informants routinely lie to their anthropologists" (Stoller and Olkes cited in Denzin & Lincoln 1994), thus we can expect that the data supplied in the ethnographic interviews, was 'slanted' to provide the bias required by the interviewee or that they believed the interviewer required. Outright lies may not be the norm as indicated above, but distortions to achieve the desired results may well be. Thus the corpus construction of the interviews was designed to achieve a wide sampling of stakeholders in the process to attempt to alleviate any such distortion.

Trans-methodological study also attempts to alleviate and compensate for any such distortions.

Chapter Five

Chapter Five contains the stories of the case study organisations. They are explanatory and exploratory in form as the stories both seek to explore the situation behind and within the process of the SPIS, and to explain the actions that arose from these situations, from the organisational data and the actors within. Grounded data analysis it is argued, provides theory and propositional development from data roots.

Chapter Four argues for organisational story telling as the best means for recounting the process of SPIS encountered in the two case study organisations. The stories explore the system and organisational boundaries and look to explain the stakeholders' perspectives of these boundaries and the organisational happenings through the period of study time. Although it has been argued by some theorists (Martin et al 1993) that a 'good' story is unique and the organisational story cannot be repeated, and it is shown through data analysis that there are common elements that can be learnt from by other organisations undertaking the same process. This study acknowledges that no two organisations can ever be the same but there are similarities that can, and should be, explored for theory development. In Chapter Five the stories are told following the stages of setting; build-up; crisis; learning and new behaviour as described by Davis 1993. The organisational stories told in Chapter Five exhibit 'hysteresis' effects – effects lagging behind the cause - and thus we can trace the earlier behaviour of the organisations to the later behaviour and happenings.

An artefact (tool or technique) - the Stakeholder Web - was introduced in Chapter Four. This tool was utilised in the data collection but was also suggested as part of the framework proposed in Chapter Six for the process of SPIS. It was argued that the tools and techniques offered as part of this SPIS Framework show ways of altering existing organisational structures as well as generating empowerment and enlightenment for stakeholders of the SPIS process. It was additionally argued that the techniques suggested would generate accommodation and consensus with alternative

conceptualisations and constructions. The tool introduced in Chapter Four was utilised in Chapter Five to enhance the situational analysis.

Chapter Six

Chapter Six provided the detailed analysis of the data collected and proposed a new framework for SPIS. This framework incorporates the novel tools described in Chapter Four and utilised in Chapter Five. Chapter Six discussed their antecedents and process of development as well showing potential ways for using them in an uncertain environment.

This chapter described in depth, the cycle of data analysis from which the organisational stories and the thick descriptions were drawn. The Document Indexer and the terms or identifiers used to tag text fragments were described and the pattern coding of themes and constructs identified. The chapter identified that in the two databases used for text grouping and analysis (one for UofA and one for UofB), there were twenty-three identical terms and eighteen unique terms, thirteen unique to UofA and five unique to UofB. It is from these common and unique identifiers that we can see both the organisational similarities and differences, for although common terms may be used in the organisational analysis; the emphasis on this activity or issue was often different in each organisation. UofB was more diverse in its terms and more organisation-centric than UofA, which was more recognisant of the idea that the SPIS process was being undertaken in a continually evolving external environment.

Thick descriptions relating to the weakness of the process of SPIS (identified in Chapter One) were provided and the potential of the proposed SPIS Framework to alleviate these weaknesses was shown.

Thick descriptions were intended here to give the context, intentions and meanings that reveal the experience of the cases as a process (see Denzin 1994). Thick descriptions can offer a richness of perception (Holliday 2002) whilst constructing patterns and 'working up' from the data towards theory construction (Richards & Richards 1994), as they have been used in this particular study.

The two universities are identified as primarily Administrative in approach (according to Earl's 1993 classification) although showing elements of other approaches. It would not be reasonable to expect any organisation to conform entirely to a model and so this deviation is to be expected.

Earl proposed four weaknesses of the bureaucratic model of planning (and by implication a fifth – that of endemic inertia) and these four weaknesses were discussed in relation to the case evidence.

Weakness One – that applications cannot be implemented until on the plan seemed to hold true for both organisations for large, resource intensive applications, although there is evidence in both organisations that small, one-person or single department applications did get developed outside the plan.

Weakness Two – that radical change is not identified and strategic enterprise level applications are rare – also seemed to hold true. It is however shown in the case evidence that eventually UofA developed a strategic level application but it seemed to be more by default than by design. The new integrating SRS was not intended as such in its original proposal and radical change was not engendered by the application. UofB in contrast was an organisation that had several ideas and plans for radical change as it changed its organisational form three times during the period studied. However, in no instance was the radical organisational change supported by strategic enterprise-level systems.

Weakness Three – that there are claims about power and political stratagems being exercised – also held true for both organisations. In UofA such fears were raised early in the case history during the consultation period and there was an element of mistrust between the committee tasked to develop the IS strategy and the committee that held the monetary power. In UofB there was a great deal of evidence of power and politics at play. In fact, it was strongly believed that one of the prime drivers for the organisational reforms was to break up power cliques. There appeared, in the eyes of those interviewed for the case history, to be a dismaying amount of misinformation and political behaviour.

Weakness Four – that the organisation would focus on the resource-allocation process – also seemed to hold true for both organisations. In UofA the strategy formulating

committee had no power to set budgets only to recommend expenditure – the issue of finance was identified in over 27% of all text fragments analysed for this university and thus was a prime point of discussion. In UofB finance was always a prime concern for this organisation, which suffered from a lack of it, and funding again was held at a level above the strategy formulating process.

With regards to the implied fifth weakness – that there was Endemic Inertia – the length of time to make decisions that results from layers of committees, inevitably leads to delays in implementation and an apparent lack of progress. Certainly in UofB many stakeholders expressed their frustration about the lack of progress being made towards improving systems. In UofA there were major delays between the beginning of the strategy formulation period and the completion of the project implementations (see Chapter Five stories).

The tools and techniques proposed in this framework (as shown in Chapter Six) permit the retrieval of sufficient available knowledge, through the use of a more inclusive set of stakeholders, to ensure a better fit of the strategy to the environment, both internal and external. The tools indicate a more appropriate system boundary than is normally expected in such processes.

7.1 Research Results and Contributions

An investigation of the literature in Chapter One showed that strategic planning for IS is a key issue for many organisations yet it has often claimed to be unsuccessful. The use of existing methodologies does not seem to enhance the likelihood of success and thus some organisations have ignored such methodologies and undertaken a piecemeal planning process that results in later problems with the major systems implemented.

The central contribution of this thesis is that it presents and proposes a systematic, multi-phase decision-making process to ensure timely, effective, optimal methods for strategic planning for information systems.

This contribution has implications for issues raised in previous research or as findings in empirical research settings, and these issues were raised in Chapter One. Four major issues were identified in the literature and these were the:

- Current lack of theory;
- Time taken for the process to be completed;
- High numbers of stakeholders likely to be involved leading to more complexity and thus more constraints;
- Predictability and stability of external environment (or lack of) which affects the planning process to make it more or less effective and efficient.

As shown below in Section 7.1.2, Issue One – the lack of current theory – has been addressed in that it is shown that this study contributes to theory development.

With regards to Issue 2 – the current time taken to complete the process, this is acknowledged as an issue but in Chapter Six it is suggested that although implementation is only scheduled at Step Seven, the repetitive nature of the SPIS Framework means some implementation or adaptation is always being undertaken. It is assumed that there is always at least a form of IS planning being undertaken in any organisation, but the adoption of the framework would strengthen and adjust this process.

Issue 3 – that of the high numbers of stakeholders involved leading to more complexity and thus constraints – is dealt with in the framework proposed through the use of the Stakeholder Web and the discovery of groupings that will permit of representation. Identification of driver and influencer stakeholders is one of the prime motivations for use of the Stakeholder Web and the Interaction Matrix within the framework in order that the essential stakeholders are well represented in the planning process.

The final issue – that of the stability or otherwise of the external environment affecting the effectiveness and efficiency of the planning process – is discussed in Chapter Three. In Chapter Six it is commented that since the business environment is continually changing, monitoring a review of the stakeholder constituency and its representation should be a routine task. The stakeholder constituency provides a constant reflection of the changing external environment and its influence on the planning organisation.

In particular, in Chapter Six two arguments are added to the existing argumentation proposed in Chapter One:

- The framework proposed is informed by a sociotechnical context, which approaches change in an holistic and participatory manner, encouraging a learning organisation that manages the knowledge of both its internal and external environment.
- The framework proposed addresses and alleviates issues identified with SPIS and the inappropriate setting of boundaries and thus the incompletion of knowledge retrieval. The framework shows ways of obtaining the required knowledge.

Thus demonstrating that the issues raised in Chapter One are alleviated and addressed by the SPIS Framework described.

The research contributions can be classified into three types: practical; methodological and theoretical and these three perspectives are discussed below.

7.1.1 Practical Contribution

From the practitioner perspective, the primary contribution of this work is that it provides strategic planners of information systems with a framework for effectively navigating through a complex decision-making process. It provides the practitioner with a set of tools and techniques that can be used, as appropriate for their organisation, and the SPIS Framework additionally provides a preliminary set of questions that should be asked in the strategic planning process.

Moreover should this approach gain usage it should facilitate a better selection of systems that provide a more optimal fit to the organisation in its environment.

It is recognised that the sociotechnical approach must need demonstrate that its use will lead to efficiency and a high morale work force amongst other things (Mumford 1997) and it is argued here that the straightforward, proactive, comprehensive and flexible framework will encourage both efficiency and effectiveness. The use of the SPIS Framework as shown in previous chapters facilitates a move towards a more inclusive and participative form of decision-making and thus should improve morale in the work force.

It was an intention of this study that an exploration of some of the reasons for system failures should be carried out. As discussed above these arguments related to a better fit of systems' boundaries to the complexity of the situation that organisations experience. The systems developed as a result of the use of this framework should prove more relevant to the organisational environment and should optimise the opportunities for system success.

7.1.2 Theoretical Contribution

This thesis should be of interest to the researcher as it presents novel and innovative tools for the process of SPIS and a specific way of viewing the process through a sociotechnical perspective that can act as a springboard for further research..

The sociotechnical principles of boundary location – where boundaries should not be drawn so as to impede the sharing of knowledge and information – and that of incompletion – where it is stated that periods of stability are only temporary periods of transition between one state and another, where redesign is continuous and teams should be in a constant process of review (Cherns 1987) would be addressed by the framework. The SPIS Framework and the tools suggested for use within it should move the organisation towards both a structure and form, as well as a culture, that supports the better sharing of information and knowledge, and additionally accepts that completion is an illusion and that re-evaluation of solutions should be continuous.

The study provides a comprehensive review of relevant literature of the theories of stakeholding from differing perspectives that illumine the debate and additionally gives a thematic analysis of the meanings of the word as used across the literature that will be of benefit to future researchers in this area. From this thematic analysis a new definition is drawn that will be useful in the debate relating to ideas of stakeholding in the IS, CIS or SPIS fields.

This study uniquely puts together a combination of theories from the management and organisational field, as well as from philosophy, ethics, and physics amongst others to give a more panoptic view of boundary and stakeholder choice.

The thesis additionally offers a framework for the retrieval of the available knowledge, through a sociotechnical paradigm (which contains the four essential elements of people, technology, organisation and task/process) adding a fifth element of environment, and utilising complexity and systems theory to inform the process. This framework differs from traditional sociotechnical thinking in including the environment within it, as more traditional sociotechnical thinking looks to people, technology and the organisation for the delineation of the boundary.

7.1.3 Methodological Contribution

This study used a sociotechnical perspective to undertake a complex organisational and theoretical exploration. It argued that a unique trans-paradigmatic combination of research methods provided the best way to approach retrospective exploratory case study work. These methods encompassed triangulation across time and multi-methods across Minger's Personal World axis (1997) by using case study analysis and interviews alongside analysis of language/action, literature and influence through diagrams. The unique use of the Stakeholder Web to assist in developing influence diagrams contributes to methodological tools for future research interventions.

The boundary location delineated defines the encompassed stakeholders in the strategy or the chosen project – and thus the knowledge held by these stakeholders. Organisational knowledge is held by stakeholders at a multiplicity of levels, and, as argued in Chapter Three, we need to retrieve that tacit knowledge held by the appropriate stakeholders. Tacit knowledge is personal, subjective, and often unconscious and can most easily be retrieved through ethnographic methods such as interviews, as shown here. Grounded data analysis is appropriate for the analysis of text and textual formulations of conversations as described in Chapter Four. Knowledge is not simply a tool or resource so much as it is a social construct and as such needs to be discovered in the social context.

Suitable ways of undertaking method combination for similar studies is thus indicated for future researchers.

7.2 Limitations of Research Approach

It is acknowledged that there are a number of issues with the research presented, one such issue being the research approach taken.

The interpretivist approach is based on biases, knowledge and understanding (which may be incomplete). Each individual interprets information based on their past experience and thus gains a unique understanding of that data. Such an interpretivist approach, it is argued in Chapter Four, is valid when there is a lack of well-grounded theories in the field of study (as in the case here and as discussed in Chapter One), and many intangible characteristics surrounding the phenomena of study. However, such an approach is always liable to criticism as any other individual approaching and analysing the data will, of necessity, due to their previous understanding of the subject matter, obtain different results to a greater or lesser degree. Case studies are always prone to this type of criticism and it is through the principle of suspicion (Klein and Myers 1999) and the generalisability of results across cases as argued in Chapter Four, and as can be argued here with the two cases studied, that this can best be alleviated.

Action research wherein the framework is implemented and analysed concurrently would improve and no doubt enhance features within the SPIS Framework, as well demonstrating which methods and techniques prove most useful in a particular situation. At present it can only be shown through analysis that had the framework been utilised the organisations' (studied) strategic plans should have resulted in systems that were provided perhaps faster, more effectively, or were more fit to the environment. The approach should be validated in a live planning situation and practical experiences and theoretical insights drawn from this situation would enhance and add further layers of definition to the proposed SPIS Framework.

The work presented has limitations as it was primarily undertaken as a retrospective study and thus analysed activities in the perspective of hindsight.

An additional issue is that it was a retrospective study of two Administrative organisations. Although the framework has been developed to address the weaknesses identified with all organisational forms (as identified by Earl 1993), it has not been shown

explicitly that this is so as only one such form was studied. However, as argued above and in Chapter Four, we can expect that through analytical generalisability (see Yin 1994) that these conclusions will apply also to other organisational forms. This would lead to further research opportunities whether retrospective, or as action research, in studying and analysing other forms of organisations undergoing the SPIS process to confirm this generalisability.

7.3 Areas for Further Research

The current lack of theory of strategic planning for information systems, and attempts to mitigate this and develop theory, have been performed by a number of authors recently (see work by Lederer & Salmela 1996, Doherty et al 1999, Mina et al 1999). Lederer and Salmela argue that a theory is necessary to focus observations and to sort these observations into classes of objects, which in turn enable the observer to understand and predict. Additionally, and more importantly, they argue that a theory permits studies to build a cumulative collection of findings that identify the antecedents that have presaged successful SPIS.

Lederer & Salemela's theory comprises of seven constructs:

1. The external environment;
2. The internal environment;
3. Planning resources;
4, The planning process;
5. The information plan;
6. The implementation of the information plan;
7. The alignment of the information plan with the business plan.

This research whilst offering a framework that attempts to incorporate these elements of theory within its actions, has not explicitly judged the results of the casework against these constructs. It has instead concentrated on offering techniques to alleviate and potentially prevent failure, whether full or partial, in the process of strategically planning for IS. This framework contains within it the possibilities of successful SPIS and was designed with this in mind.

It would therefore be appropriate to undertake a further analysis of the data collected for this study, concentrating on the theory of SPIS offered above and to explicitly identify where the both the data, and the SPIS Framework developed, match and enlighten this theory.

Further research must also focus on seeking opportunities to apply and validate the approach in a live SPIS process, as well as using practical experiences and theoretical insights to add further layers of definition to the framework.

7.3.1 Use of the Stakeholder Web and Interaction Matrix

A further opportunity for research would be through development of the Stakeholder Web and the Interaction Matrix. The Stakeholder Web, although used here as a means of identifying stakeholders in the process of SPIS, can also be used in other stakeholder discovery processes. A research project is planned to assess the value of the stakeholder web in knowledge management, to discover who holds what knowledge about a particular process etc. Through its use as a means of grouping stakeholders according to function, it is expected that it will also be able to identify interested parties for Communities of Practice (note that such a community – CoP - can be defined as a group of individuals, which may be co-located or distributed; motivated by a common set of interests; willing to develop and share tacit and explicit knowledge; with each CoP being a focus of learning and competence for the organisation. See the discussions on CoPs by Wenger 1997, Liedtka 1999, and Storck 2000). As in the SPIS Framework described here, the web can be constructed through a series of interviews through a corpus construction, as shown in Chapter Four.

The interaction matrix can be used to crosscheck who talks to whom and therefore where the linkages between CoPs can be expected to occur.

The advantages of using these tools in addition perhaps to a social network analysis, is that they are agenda free and are looking for who holds knowledge rather than power, the social network analysis will illumine the interaction matrix and vice versa.

In conclusion, this study has explored the concept of stakeholders and boundaries within the process of SPIS and contributed to research relating to SPIS development. It has uniquely utilised a sociotechnical perspective and it is hoped that the ideas generated by

the research will contribute to the debate on suitable organisational forms and decision-making structures in a complex environment. The framework proposed, it is anticipated, will be of benefit to large organisations undertaking the SPIS process and may alleviate many of the computer information systems failures that currently are so widely reported.

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APPENDIX ONE

Definitions from the literature in the Management/Organisational field (M/O) and the Information Systems field (IS)

Date	Author	Field	Definition
1963	Stanford Research Institute	M / O	those groups without whose support the organisation would cease to exist
1964	Rhenman E	M / O	the individuals or groups which depend upon the company for the realisation of their personal goals and on whom the company is dependent
1971	Ahlstedt & Jahnukainen,	M / O	driven by their own interests and goals are participants in a firm and thus depending on it and whom for its sake the firm is depending (cited in Nasi. 1995)
1979	Mitroff & Emshoff	M / O	all parties who will be affected by or who affect an important decision
1980	Mitroff & Mason	M / O	those who depend on the organisation for the realisation of some of their goals, and in turn, the organisation depends on them in some way for the full realisation of its goals
1981	Mason & Mitroff	M / O	all those claimants inside and outside the organisation who have a vested interest in the problem and its solution
1983	Freeman & Reed	M / O	Wide: can affect the achievement of an organization's objectives or who is affected by the achievement of an organiz tion's objectives Narrow: on which the organization is dependent for its continued survival
1984	Mendelow	IS	the claimants of organisational effectiveness; those involved in the actual development, operation and use of the system
1984	Freeman	M / O	any group or individual who can affect or is affected by the achievement of the organisation's objectives.
1985	Ullman	M / O	Following Freeman: external stakeholders are defined as any group or individual (in the company's environment) who can affect or are affected by the achievement of the organisation's

			objectives.
1986	Boddy & Buchanan	IS	all those who are a practical concern for the effective application of new technologies and who are in a position to take and influence decisions about why and how they are used. Managers; systems designers; project teams; trade unionists; operators; consultants.
1987	Freeman & Gilbert	M / O	can affect or is affected by a business
1987	Cornell & Shapiro	M / O	have a stake in or claim on the firm
1987	Willcocks & Mason	IS	Computer systems will have many stakeholders. These are people who will be affected in a significant way by, or have significant interests in the nature of the new computerised system. Interested parties are: managers; users; programmers; analysts/designers; computer preparation and processing staff; financiers of scheme; other affected organisational members; customers; computer firms and their sales staff.
1987	Lyytinen	IS	uses Mason & Mitroff 1981: all those claimants inside and outside the organisation who have a vested interest in the problem and its solution
1987	Lyytinen & Hirschheim	IS	the person or group of people sharing a pool of values hat define what the desirable features of an IS are and how they should be obtained.
1988	Bowie	M / O	without whose support the organization would cease to exist
1988	Evan & Freeman	M / O	benefit from or are harmed by, and whose rights are violated or respected by, corporate actions
1988	Lyytinen	IS	a vested interest in the IS. The interests originate from a personal, or a group advantage that accrues from controlling important material or organisational resources.
1988	MOD/DTI	IS	all those who have a legitimate 'stake' in the new system (the Guidelines concentrate on Users as key stakeholders).

1989	Alkhafji	M / O	groups to whom the corporation is responsible
1989	Carroll	M / O	asserts to have one or more of these kinds of stakes - ranging from an interest to a right (legal or moral) to ownership or legal title to the company's assets or property
1989	Earl	IS	Stakeholders in IT are: Business Users, Government, Manufacturers, Consumers, Customers/Suppliers, Competitors, Employees
1989	Klein & Hirschheim	IS	major stakeholder groups: users, system developers and managers.
1989	Hirschheim & Klein	IS	stakeholders are a diverse group of individuals including customers, labour and their representatives, heterogeneous levels of management and the owners of the productive resources
1990	Freeman & Evan	M / O	contract holders
1990	Jones	M / O	clientele (employees of different types, stockholders, creditors, customers, suppliers, the public and so on)
1990	Vedder & Turban	IS	major influencing parties (called stakeholders) From Rowe, Mason & Dickel 1986: a stakeholder (is) a public or private, formal or informal, singular or plural entity which demands: a voice in an organisation's decisions .. Stakeholders are claimants on the organisation. They depend on the organisation for the realisation of some of their goals and thereby have a stake in its activities. The organisation, in turn, depends on them for the full realisation of its purpose.
1990	Vincent	IS	all parties who have a vested or implied interest in the enterprise
1991	Freeman R E & Liedrka	M / O	stakeholders are broadly defined to include suppliers, community, employees, customers and financiers. corporations are connected networks of stakeholders.

1991	Mallak, Patzak & Kurstedt	M / O	workers involved in the project; corporate division / governmental agency; parent corporation / government; customers; capital suppliers; subcontractors (consultants, contributors to the project); users of the project; authorities and regulatory agencies; the public (as represented by special interest groups, lobbyists); and non-human (e.g. scientific environment, natural environment)
1991	Ruohonen	IS	different interest groups - the three critical stakeholder groups in the strategic information systems planning process - top management, user management and IT/IS management
1991	Thompson et al.	M / O	in relationship with an organisation
1991	Savage et al.	M / O	have an interest in the actions of an organization and... ability to influence it
1991	Wood	M / O	based on Freeman 1984: including governments, competitors, consumer and environmental advocates, the media and others, in addition to the traditional stakeholder groups (owners, customers, suppliers, employees)
1992	Hill & Jones	M / O	groups of constituents who have a legitimate claim on the firm. This legitimacy is established through the existence of an exchange relationship.
1992	Subramanian	IS	quotes Freeman 1984: a stakeholder is any group or individual who can affect or is affected by, the achievement of a corporation's purpose.
1993	Brenner	M / O	having some legitimate, non-trivial relationship with an organization (such as) exchange transactions ... action impacts, and moral responsibilities
1993	Carroll	M / O	*Stakeholders* are individuals or groups with which business interacts who have a 'stake' or vested interest, in the firm
1993	Farbey, Land & Targett	IS	who are the 'holders' and what are their 'stakes'? Internal stakeholder map overlaid on Mintzberg's framework
1993	Goodpaster	M / O	using RE Freeman - defines the term as follows: A stakeholder in an organisation is (by definition) any group or individual who can affect or is affected by the achievement of the organisation's

			objectives.
1993	Johnson & Scholes	M / O	stakeholders are groups or individuals who have a stake in or an expectation of, the organisation's performance, and include employees, managers, shareholders, suppliers, customers and the community at large. Stakeholders may be identified ... because they undertake a common task ... stakeholders also arise as a result of specific events
1993	Stacey	M / O	the stakeholders of an organisation are its owners, managers, employees, customers, suppliers, trade bodies, trades unions, government authorities and common pressure groups
1993	Thompson	M / O	Freeman (1984) defines stakeholders as any group or individual who can affect, or is affected by, the performance of the organisation.
1994	Freeman	M / O	participants in the human process of joint value creation
1994	Wicks et al..	M / O	interact with and give meaning and definition to the corporation
1994	Langtry	M / O	the firm is significantly responsible for their well-being, or they hold a moral or legal claim on the firm
1994	Starik	M / O	can and are making their actual stakes known - are or might be influenced by, or are or potentially are influencers of, some organisation
1994	Clarkson M, Stavik M, Cochran P, Jones et al.	M / O	bear some form of risk as a result of having invested some form of capital. human or financial. something of value, in a firm or are placed at risk as a result of a firm's activities
1994	Lewis	IS	in SSM: it may be useful to distinguish between those actors who are powerholders and can affect the operation of decision making in the situation and other stakeholders, who do not.
1994	Sampler & Short	M / O	in process re-engineering projects at the least these are stakeholders of a project (re-engineering sponsor, project manager (operational), major customer, and business planner.

1994	Sauer	IS	stakeholder whose values and interests should form a basis for ascribing (failure)
1995	Brenner	M / O	or which could impact or be impacted by the firm/ organization
1995	Clarkson	M / O	have, or claim, ownership, rights, or interests in a corporation and its activities
1995	Donaldson & Preston	M / O	persons or groups with legitimate interests in procedural and/or substantive aspects of corporate activity
1995	Lacity & Hirschheim	IS	stakeholders of IS Strategy are: Senior Management; Business-unit Managers and Users; IS Managers.
1995	Nasi	M / O	interact with the firm and thus make its operation possible
1995	Pouloudi & Whitley	IS	participants are taken to be individuals, groups or organisations who take part in the system development process. We define stakeholders as these participants together with any other individuals groups or organisations whose actions can influence the development of the system whether directly or indirectly.
1995	Smitts	IS	Decision Makers are stakeholders or actors, with social interests, normative orientations and mental models
1996	Vidgen & McMaster	IS	stakeholders are any human or non-human organisational unit that can affect as well as be affected by a human or non-human organisational unit's policy or policies
1998	Pouloudi	IS	a stakeholder of an interorganisational system, is any individual, group, organisation or institution who can affect or be affected by the interorganisational system under study

APPENDIX TWO

Account Gathering

	Research Strategy	Control Procedure
Informants	Definition of episode and role groups representing domain of interest	Rationale for choice of episode and role groups
	Identification of exemplars	Degree of involvement of potential informants
	Selection of individual informants	Contact with individuals to establish motive for participation, competence and performance
Account Gathering Situation	Establishing the venue	Contextual effects of the venue
	Recording the account	Appropriateness and accuracy in documenting the account
	Controlling the relevance of the account	Accounts agenda
	Authenticating the account	Negotiation and internal consistency
	Establishing role of interviewer and interviewee	Degree of direction
	Post account authentication	Corroboration
Transformation of Accounts	Provision of working documents	Transcription reliability; coder reliability
	Data reduction techniques	Appropriateness of statistical and content analysis
Researchers' accounts	Account of the event - summary, overview, interpretation	Description of research operations, explanatory scheme and theoretical background

APPENDIX THREE

The Higher Education Sector in Context

A3.1 Higher Education in the UK - the Historical Context

From the time of the Second World War up to the establishment of the Robbins committee in 1961, the relationships between the universities and the government were mutually supportive and cordial. But no real policy had been established by either the Government towards universities, or the universities towards addressing the nation's need (Shattock 1996). At this point in time (late 1940s) the nation (ie Great Britain) had 16 self-governing universities, each of which had developed in its own way (Simon 1947).

One additional university was created in 1950 - the University College of North Staffordshire, but the emphasis during this period, was on expanding the existing universities and strengthening their output of graduates in science and technology. The reasons for this expansion were various but included:

- A change of opinion (government) as to the importance and benefit of extending education to a larger proportion of the population;
- The realisation, post second world war, of the urgent need for more scientists;
- To meet the claims of ex-servicemen who had missed their chance for university education due to the war;
- And the resulting allocation of government finance.

In Table A3.1 below, the increase in student numbers over the first half of the twentieth century is clearly shown.

Table A3.1 Student Numbers in Universities (Shattock 1996)

1911	20,000	in England & Wales
1921	36,000	stable with drop in 1940-6
1951	64,000	

The formation of a centralised university admissions process in 1962 was a crucial step towards a national university system, and brought both Oxford and Cambridge into a national process for the first time.

In 1963 the Robbins Committee reported and a new face to Higher Education (HE) in the UK was created. The Robbins Committee said that HE was a national necessity and that the principle adopted behind the Government's policy should be that everyone merits an education appropriate to their intellectual capacity and willingness to learn. In addition it was felt necessary for there to be an expansion of university places available in the late 1960s because of the:

- Population bulge post war;
- Proportion of secondary school students staying on into the 6th form increasing by approximately 5%pa;
- Current unsatisfied demand (ie in the late 1950s and early 1960s there were insufficient places for those applying).

It was estimated that if the proportion of students going to university remained constant there would be a need for 92,400 places in 1965-9, and 82,400 places in 1970-3. However if the proportion going to university increased by the 5% that were additionally staying on for sixth form education, then the demand for places would be 134,00 in 1965-9 and 138,000 in 1970-3. Robbins however recommended 558,000 full-time places in HE by 1980-1, of which 350,000 should be in the university sector.

This was based on the principle that "courses of higher education should be available for all those who are qualified by ability and attainment to pursue them and wish to do so" ((Report § 31) as quoted in Trow 1964). The estimates in the Robbins report were based on the:

- Size of the appropriate age group (18-21);
- Proportion of the age group obtaining relevant qualifications;
- Proportion of the age group obtaining relevant qualifications who would be likely to apply;
- Likely expansion of numbers in foreign students and increasing lengths of some courses.

These estimates however did:

- **Not** take into account the upward trend push of the (then potential) raising of the school leaving age (under discussion but not in fact implemented until 1974). Even though only a small proportion of those staying on to 16 could be expected to go into a 6th form, and even though of those only a further yet smaller proportion could be expected to want to go to university, the consequences of any additional numbers would be large;
- **Not** take into account changes in public attitude to the desirability of higher education and knock on effect that the report itself would cause;
- **Not** take into account job market and trend towards lower job market for adolescents and the increasing demand for skills;
- **Not** take into account the knock on effect of parental educational levels (Trow 1964).

In fact Robbins proved to be too conservative in estimating those who would obtain relevant qualifications for HE by over 20% (Venables 1966). This increased pressure for technical institutions to provide degrees through either the London External degree system and later through the Council for National Academic Awards (CNAA). Ultimately it increased pressure by those granting such degrees to become fully fledged universities.

Accordingly there was needed an expansion of the HE sector if the Robbins report was to be accepted. For financial reasons the then current Secretary of State for Education and Science, Antony Crosland, proposed a binary system whereby university charters were granted to a number of existing Colleges of Advanced Technology and several new Polytechnics were established.

The universities created under this scheme included:

East Anglia, Essex, Kent, Lancaster, Sussex, Warwick, York, Stirling, Ulster, Keele, Brunel, and The Open University in 1970. The main objects behind creating these new charters were to provide more university places (cost-effectively) and to encourage these institutions to become centres of innovation in university education.

In 1964 the CNAA was given a charter to award degrees and in 1965 3000 students registered for CNAA validated degrees, by 1969 this number had risen to 19,000.

In 1966 a white paper: 'A Plan for Polytechnic and Other Colleges: Higher Education and the Further Education System' was published. As a result over 30 colleges or groups of colleges were designated as Polytechnics. It was proposed that by 1969-70 there would be 70,000 students in these Polytechnics. Staff would be primarily teaching oriented with some research duties, and there should be strong links with industry and commerce. These Polytechnics would be locally oriented and technologically biased, they would be open to part-time students and part-time teachers/lecturers.

The arguments given in early 1970s for the emphasis on part-time students included the significant numbers of adults that did not attend university due to lack of money or lack of available places; the number of adults that were late developers; the national need for scientific, technical, professional and social skills that needed to be addressed in the current adult population; the rate of knowledge growth acceleration and the frequent updating that was therefore required; the necessity to address the inequality of education for women; and that it was a more efficient and economic way of using national resources in support of public education. It was thus the responsibility of Polytechnics to take these factors on board and to provide suitable education for these sectors.

For the academic year 1980-1 there were estimated to be 530,000 full-time and 305,000 part-time students in Great Britain (Carter 1980). Of these full-time students 301,000 would be in universities and 229,000 studying elsewhere.

In 1980 there were 37 universities including post-graduate business schools, 30 polytechnics and the Open University, operating in England and Wales. The universities were considered to be private corporate bodies which were not answerable to either ministers of the Crown nor to Local Government Authorities. They were not part of the

Public Sector and their powers derived directly from their Charter which was granted by the Privy Council. In contrast the polytechnic sector were directly under governmental control. They were part of the planned sector. They were approved by Local Authorities and responsible to Local Authorities. Local Authorities were in control of their finances and staff conditions and the CNAA controlled their ability to grant degrees. All this in contrast to the universities who were unplanned and subject to none of these controls.

The 1980s saw a number of white and green papers (1985, 1987) published by the Government looking into the future of Higher Education and the needs of the country in relationship to Higher Education.

The 1985 Green Paper on the Development of Higher Education into the 1990s commented again on the disappointing economic performance of the UK since 1945 in comparison to its competitors and emphasised the necessity for HE to contribute more effectively to improve the performance of the economy. It said that there was particular evidence that the UK's competitors were aiming to produce more scientists, engineers, technologists and technicians than the UK. A new initiative had been announced in March 1985 to increase the number of electrical engineering places in HE but there was little point in increasing capability at this level if there was not complementary increase in teaching at a lower level. There was a need for both schools and employers to convince potential students of the possibilities of a rewarding career in engineering. The projected demand for places in the university sector according to this green paper was between 566,000 (full-time) and 612,000 in 1989-90 and falling to between 492,000 to 525,000 in 1996-7.

In 1987 the National Economic Development Office (NEDO) published the results of several years' study called 'Information Technology Futures - it can work'. In this report they considered a number of issues regarding the then economic, social and educational climate, and made predictions and recommendations for the future. Although their specific brief was Information Technology and the Information Age, some of the results of their enquiry related generally to the Higher Education sector and provided evidence for a necessary shift and increase in educational skills amongst the UK workforce.

The analysis of the UK workforce for 1985 against the predicted workforce for the year 2010 (see Table A4.2 below) shows a dramatic drop in those expected to be employed in such areas as managerial work; clerical and related work; processing, making and repairing work; and painting and repetitive assembly work. Against this was a significant increase in work in only one area - literary, artistic and sport.

Table A3.2 Occupational Change Forecast (NEDO 1987)

Work type	1985 (000s)	2010 (000s)
Professional, educational and health	2500	2100
Literary, artistic, sport	225	400
Professional, science, engineering, technological	1000	1100
Managerial	2200	1300
Clerical and related	4000	2000
Sales	1300	600
Processing, making, repairing	4000	1000
Painting, repetitive assembly	1000	200
Others (including agriculture, services)	7000	6600
Total	**22-23m**	**18-19m**

They based their estimates on the pattern that had emerged from 1978 - 1984 where supervisors, foremen, craftsmen, operatives, technicians and clerical staff had shown a drop in employment. In fact craft and assembly jobs had fallen by 12,500 and scientific and technological jobs had increased by approximately 51,000 (NEDO 1987). The NEDO report anticipated a longer life (age expectancy) for people with a shorter working life. They put forward the proposition that the idea of a 'job for life' was obsolete, and that the population at large required extended education, above what was then normal. They anticipated also that people could expect two or three periods of significant re-training during their working lives.

They were particularly concerned, considering the above, at the low participation in post-16 education by the UK population, especially in comparison to UK economic competitors. (See Table A4.3 below). As compared to these major economic competitors (defined as the United States of America (USA), Japan and Western Germany), the UK

had the highest percentage of the working population without qualifications in 1981. Where the USA had only 22% of the population without formal qualifications, and Japan had 40%, with Western Germany having 34%, the UK had 50%.

Table A3.3 Participation in Education and Training as Percentage of 16-18 year olds 1981 (NEDO 1987)

	M	F
UK	64	61
Western Germany	87	82
USA	80	78
Japan	76	70

These Governmental papers resulted in the Further and Higher Education Act of 1992 when existing Polytechnics and some Higher or Further Education Colleges that met the requirement, were translated into 'new' universities and the idea of the polytechnic was no more.

A3.2 The University Sector in the 1990s

This was a period of great expansion in student numbers and HE courses available through both universities and colleges either franchised or partnered with universities. In 1992, the previously created Polytechnics were granted the status of University along with a small number of Colleges of Higher Education who fulfilled the government criteria in terms of student numbers and degree awarding capability. By 1996 Britain had 105 universities and a very clearly defined university system.

In the early part of the 1990s, the government encouraged the expansion of higher education in recognition both that the country needed more highly educated people to meet the demands of the economy, and that more people from different sectors of society wanted to go into higher education. It brought this about through: providing increased funds; abolishing the binary divide and introducing more independence to polytechnics and colleges; introducing competition between universities for students; changing the student maintenance arrangements (new student loans) and encouraging access initiatives; and the development of more vocationally and work-orientated

education. It also introduced a new quality assessment system for research and teaching (Connor et al 1996).

The participation rate (of the proportion of the population obtaining university education) in fact rose from around 15% in the 1970s to 31% by 1995 (Shattock 1996). Although bodies like the Confederation of British Industry (CBI) in their report of 1994 generally supported this expansion, they were anxious to see the participation rate rise even higher to 40%. They justified this on both social and economic grounds, although admitting that there was some evidence of bottlenecks in some professions and degree areas where the supply of undergraduate degree holders was outstripping demand (eg law and psychology as quoted in Shattock).

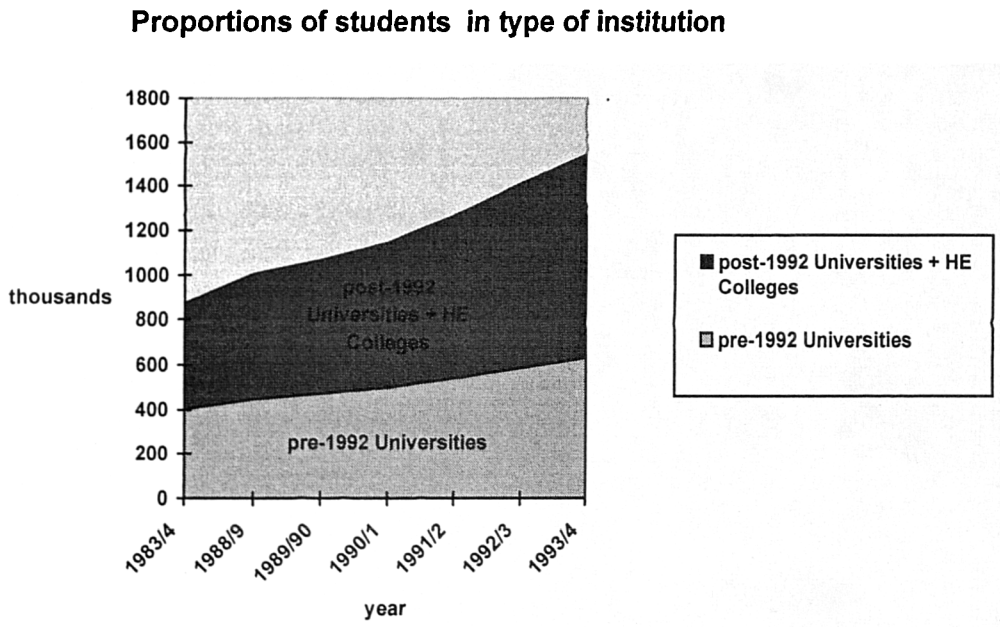
In fact the growth in student numbers between 1988/9 and 1993/4 was 54%. This growth was mainly concentrated in the HE Colleges and the post-1992 universities where the growth rate was 63%. This expansion was faster than forecast for a number of reasons:

- The government's policy on targets for participation changed to line up more with that of economic competitors (the USA participation rate in university education was around 30%);
- The development of access policies allowed greater participation by non-traditional entry students (full-time students aged over 21 years on entry grew by over 100% in this period);
- A broader, more flexible provision of education (by post-1992 universities in particular) permitted greater participation by part-time students.

In fact the growth was so rapid that in 1994 the government announced a capping of student numbers and funding constraints aimed at slowing down the growth. In 1994 the government slowed down the expansion providing funding available that was equal to 77% of that available in 1989/90. This was partly because the government felt that it could no longer afford the growth of students; and partly because demand had greatly exceeded expectations. Therefore the targets set in 1989 for one in three young people to gain a university place by the year 2000, had almost been achieved in 1992/3. During the 1990s there was regularly an oversupply of students against available places in university based HE that resulted in the provision of HE courses at franchised institutions and

partner colleges. Figure A3.1 below, shows the growth in student numbers over the period 1983 to 1993/4, indicating that the fastest growth was in students attending the so-called 'new' universities. HESA statistics showed the numbers of home first year students rising from approximately 200,000 in 1981 to 250,000 in 1989, to 400,000 in 1983 and over 600,000 in 1995. At the same time unit costs per student dropped from nearly £7000 per full-time equivalent student (in real-term 1995/6 prices England) in 1989/90 to £5,500 in 1992/3 to £4,900 in 1995/6, with a predictor based on Government spending plans announced, of being £4,400 in 1998/9.

Figure A3.1 (Figures taken from HESA statistics 1996)



In 1995 there was a further period of consolidation announced to keep student numbers static until 1999. Further squeezes in unit funding and capital funding were announced, with the expectation that the Private Finance Initiative would take up any shortfall in capital funding for the universities.

One thing that has proved very clear from all the studies done in the 1960s, 70s, 80s and early 90s, was that estimating potential numbers of university students was hazardous. It is difficult to compare statistics as many reports base their figures solely on estimated university places and others include other forms of HE. The HEQC report of 1994

predicted the number of students in HE to reach 1,440,000 in the year 2000, which contrasts dramatically with the Green Paper of 1985 which expected around 525,000 in 1996-7 and a steady drop from there.

Factors that the studies indicated might affect future student demand would include:

- Demography including changes in social class structures (the numbers of 18 year olds in the population was increasing – to maintain the 30% participation level there would need to be an additional 60,000 extra places in the year 2000 and 95,000 by 2007 – Richards 1997);
- Educational achievements of young people;
- Parental and social influences on young people;
- Signals from the labour market, the existence of alternative employment opportunities;
- Availability of alternative routes into Higher Education, ease of access for adults to participate;
- Cost of participating and expected rate of return (financial);
- Public perception of quality of university experience eg overcrowding, student poverty;
- Institutional initiatives targeted on under-represented groups.

It was estimated by the 1994 CBI report that by the year 2005 30% of all new entrants to first degrees would be 21years of age and upwards, and that 27% would come from a vocational route.

Unfortunately, research in 1997 showed that targeting of non-traditional students for HE was not succeeding in the way expected. Young people from the wealthiest neighbourhoods were five times more likely to attend HE in 1997 (Swain 1997a)

The HEQC report of 1994 stated that:

- They had been interested to identify a long-term continuity of policy over the past thirty years since the Robbins Report ... The key feature is a gradual move towards a more participative further and higher education. There have been frequent set-backs to the momentum ... but in the long-term, certain policies seem to persist;
- Universities and colleges have remained academically autonomous;
- Institutions have been expected to meet diverse needs, regionally as well as nationally;
- Higher education has not been formally structured hierarchically although different missions will be evident;
- Entry to higher education will continue to be available in increasing numbers to those able to benefit from it.

During this period there was also an increasing demand for places at UK universities by international students, from 48,000 in 1983/4 to 105,000 in 1993/4. This been as a result partly of the Erasmus programme whereby students can 'swap' years or semesters within the European Community and a similar scheme with the USA; partly because UK education has proved to be price competitive against other countries; and partly because of efforts from UK universities to promote themselves due to a need for additional, un-capped, funding.

The 1995 Budget (as discussed in the Lecturer 1996) proposed a 7% real-term cut in funding to HE in 1996/7, rising to a cut of 12% in 1998-9, with additional cuts in capital funding of 31% in 1996/7, rising to 58% in 1998/9.

Further statistics for the early 1990s showed that UK universities had a significant impact on and for, their local economies. Between 18% and 48% of English undergraduates studied in their home region, between 30% and 57% took up employment in their home region and between 8% and 70% in the university region (University and Economic Development 1997). Mature students in particular are influenced by the location of the university, one study showing that 43% of mature students (those over 25 years) study less than 40 miles from their home (University and Economic Development 1997), whilst student hardship also influenced choice of location as 50% of students from socio-economic group 5 studied in their home region.

A3.3 A Change in Government

In 1997 a new Government was voted in. Whilst the universities and university lecturers had high hopes of redressing some of the funding cuts of the past years under the Conservative government, the incoming Labour government pledged initially to keep to the previous spending plans for two years. In addition, they would not comment on whether or not they would implement the conclusions and recommendations from the commissioned report on HE by Ron Dearing.

The new government inherited a sector where funding cuts had achieved 35% in real terms during the period of 1987-1997 and where there were warnings of a deficit of £17,000,000 in the sector, there was a backlog of £1.25 billion for essential maintenance and £500,000,000 for priority research equipment (Swain 1997b) and a lag in university lecturers' pay against other public sector workers – it was estimated that the pay of all lecturers including professors, in all universities had risen by 252% since 1980 against 317% for public sector workers (Thomson and Tysome 1997).

Universities were increasingly showing the strain of expansion whilst funding was being squeezed. In 1994, 28 institutions reported a deficit of income over expenditure rising to 41 in 1995 and 66 institutions in 1996.

A3.4 The Dearing Report and the Universities

In July 1997 the long awaited Dearing report was finally published. It was extremely comprehensive and voluminous (the final report including appendices weighing some six kilos).

The report had been commissioned in 1996 by the Secretaries of State for Education and Employment, Wales, Scotland and Northern Ireland to:

> "... make recommendations on how the purposes, shape, structure, size and funding of higher education, including support for students, should develop to meet the needs of the United Kingdom over the next twenty years." (R Dearing Higher 1997a pI).

The report discussed a 'new compact' that included the idea of a fair proportion of public funding and funding stability, a greater financial contribution from students, graduates

and the families of students towards the cost of their higher education. Amongst the recommendations there included:

- The establishment of an Institute of Learning and Teaching (Recommendation 14);
- That all HE institutions in the UK should have a communications and information strategy by 1999/2000 (Recommendation 41);
- That there should be appointed an independent pay review body (Recommendation 50);
- That over the long term the public spending on HE should increase with the growth in GDP (Recommendation 71);
- That the balance of funding should shift away from the block grant and towards following the student (Recommendation 72);
- That public funding should be determined on a rolling 3 year basis (Recommendation 73).

There was expressed a concern that there had been a unit cost reduction (in the support for students) of more than 40% over the last twenty years and that this had been achieved, in part, by under-investment in the infrastructure. Public spending as a percentage of GDP had stayed the same over the previous 20 years whilst student numbers had more than doubled.

> "Substantial redundancies are now in prospect and many staff feel that their contribution to the achievement of higher education over the last decade is undervalued. The concern now is that short term pressures to reduce costs, in conditions of no growth, may damage the intrinsic quality of the learning experience which underpins the standing of UK awards." (Dearing Report 1997b pvi).

The report also emphasised the necessity for the UK to invest in higher education in order to meet competition from around the world – knowledge would be at an increasing premium.

The committee's report was welcomed in many quarters but the Government was not required by law or indeed by moral obligation, to accept some or any of the recommendations, and such was the disquiet over the idea that the government would 'cherry-pick' that a senior member of the Dearing Committee went on record to warn against this as it would undermine the report (Thomson 1997). In comparison Trow

published an article claiming that Dearing was flawed. The committee contained no representatives from the teaching and research communities that had direct experience - it was written from the 'outside, looking in' (Trow 1997).

> "The report's very clear message is that given the new conditions in British higher education - higher staff/student ratios, larger class sizes, less contact time with teachers and so forth - better management must replace the missing resources." (Trow p26).

The result of the Government's lack of decisiveness about what, if anything, to accept from the Dearing Report led to a confusion amongst students and potential HE applicants about what was to happen in the future, in particular in regard to fees. This resulted in a drop of applications across the entire HE sector for the academic year to start 1998/9 (apart from Agriculture) - a confusion that resulted from uncertainty about whether there would be fees to pay and if so who would pay them, and a worry about debt (Higher 1997). There was a final rush in the December of 1997 to apply for places but the overall fall was some 6% in applications as against the previous year despite a small rise from overseas and EU which offset to some extent the sharp fall in home applications (Swain 1997c).

In fact the Government took seven months to produce a full response to the report, even so it refused to comment on some items until the comprehensive spending review (CSR) it had planned had completed its work and reported in mid 1998. The CSR sought to identify and eliminate departmental waste whilst also enforcing policy priorities and focusing spending (Thomson 1998a). One area that was to be targeted in HE was the widening of participation and funding would follow. This was particularly important as the application figures published in June 1998 (Swain 1998) showed a sharp drop in applications from mature students - 11.5% for 21-24 yrs old and 15.1 % for those over 25.

Especially worrying was a financial analysis by Noble Financial Publishing (Wojtas 1998) showing that debt levels in the HE sector were continuing rise as staff were being made redundant. Total debt across the sector had risen by 33% during the period 1994-97. This debt level was highest in the post-1992 sector and lowest in the pre-1950 sector of universities. Yet the CSR continued to require an efficiency saving of 1% from the HE sector. The 'extra' money apparently allocated to the universities announced in the CSR

was in fact, when inflation and the cost of funding the additional students required by government growth targets were taken into account, a decrease in 0.8% of funding (Utley 1998).

Worse was to come in terms of applications from mature students - by September 1998 (Thomson 1998b) acceptances for university places from the over 25s showed a drop of 33% below 1997's figures. In addition there was a 30% drop from 21-24 year-olds and 12.5% from under 21s. In 1999 the pattern was repeated with both an overall drop in applications and a further drop in mature applications - down by 11% (Goddard 1999). The National Union of Students blamed the drop on the introduction of tuition fees but some drop would have been likely as the available pool of mature students was diminishing.

Whilst all the arguments about funding were carrying on and a drop in funding was being received year-on-year, a shift in the character of HE was also occurring. In 1998 (Lecturer 1998) it was estimated that over half of all students were being taught in new universities with proportionately more women being in HE than men (921,000 to 834,000) and an ever-growing part-time sector. Overseas student numbers were also growing both from the EU and from further afield, as were the numbers attending postgraduate courses.

There were more than two million people enrolled in HE in the academic year 1997-98. Of these 1,316,155 were full-time students and 990,000 were first degree students. The remainder were enrolled either part-time or on other course (including some FE ranked courses that were taught in HE institutions). Four per cent more students received a postgraduate qualification between 1996-7 and 1997-8 (115,000 students in total of whom 28,200 came from overseas) - (Higher 1999a pp2 source HESA)

To attempt to counter some of the issues with attracting mature students a number of financial measures were put in place to commence in the autumn of 2000 for 'low income' part-time students. Yet at the same time an upper age limit was set on all loans to students of 54 years. In addition, more funds were announced to recruit students from 'disadvantaged' backgrounds - a five percent premium to selected universities who could

offer additional places for students coming from 'poor' backgrounds - decided on their home postcode basis.

A3.5 Governmental Demands on Universities

In 2000 the Times Higher ran a story concerning the amount of money 'wasted' in universities due to governmental red tape – it was estimated by a shortly to be published report by the Higher Education Funding Council for England, that £250,000,000 per annum was spent on 'bureaucracy'. This included the cost of submitting to a Quality Assurance Agency (QAA) subject review as well as the cost of running the QAA itself and the cost involved in delivering required statistics to the government. These statistics included financial information for Hefce, statistics for HESA and from research councils, the Teacher Training Agency, Europe, the National Health Service and other external stakeholders. Whilst many of these statistics were also required internally by universities, the format and delivery of them was controlled externally by the agency requiring them (Baty P 2000).

It should be noted that Governmental demand for more and more in-depth statistics increased during the period under consideration by these thesis. It was also expected that as the Government plans for increasing participation in higher education by the general population and greater representation of the minorities by ethnic origin, social status, postcode accommodation, physical or other disability etc came to further fruition that yet further statistics would be required. Thus increasing the burden upon universities to ensure that their data relating to student intake was increasingly accurate and detailed.

This then was the general and political background against which the organisational stories in Chapter Five are told.

APPENDIX FOUR

TABLE A4.1 Full listing of all terms in Document Indexer for UofA

UofA Top Terms	UofA second layer	UofA third layer	UofA fourth layer	UofA fifth layer
1. Accessibility	Required accessibility			
	Universal accessibility			
2. Ad hoc activities				
3. Adapting procedures				
4. Administrative functions				
5. Advantage IS delivery				
6. Advertisement				
7. Approach				
8. Appropriate	Appropriate application			
	Appropriate change			
	Appropriate consultation			
	Appropriate functionality			
	Appropriate information source			
	Appropriate level			

UofA Top Terms	UofA second layer	UofA third layer	UofA fourth layer	UofA fifth layer
	Appropriate software			
	Appropriate use			
9. Assumptions				
10. Centralised				
11. Challenges				
12. Changes/changing	Change management			
	Changing environment	Changing technology		
		External changes		
		External factors		
	Changing needs			
	Changing role			
	Organisational change	Culture	Cultural change	
		Organisational issue		
	Rapid change			
13. Co-operation	Co-operative development			
	Co-operative working			
14. Co-ordination	Co-ordinated and			

UofA Top Terms	UofA second layer	UofA third layer	UofA fourth layer	UofA fifth layer
	coherent			
	Co-ordinated development			
	Co-ordinated systems			
15. Coherent				
16. Committee	Committee reporting			
	Committee liaison			
	Committee member	Rationale for membership		
	Committee reform			
	Committee relationships			
	Committee remit			
	Committee responsibility			
	Committee review			
	Committee role			
	Committee tensions			
	Group rationale			
17. Communication				
18. Competency				

UofA Top Terms	UofA second layer	UofA third layer	UofA fourth layer	UofA fifth layer
19. Competition	Competitive edge			
	Competitive environment			
	Successful competition			
20. Complexity				
21. Comprehensive	Comprehensive systems			
22. Confidentiality				
23. Consultation	Consulting more widely	Need for wider consultation		
	Focused consultation	Mechanisms for consultation		
24. Continuing/continuous	Continuing change			
	Continuing growth			
	Continuing process			
	Continuing improvement			
	Continuous review			
25. Current practice				
26. Data	Central data			
	Common core data	Core of data		
	Data access			

UofA Top Terms	UofA second layer	UofA third layer	UofA fourth layer	UofA fifth layer
	Data accuracy			
	Data as a resource			
	Data completeness			
	Data confidence			
	Data confidentiality			
	Data control	Data security		
	Data creation			
	Data maintenance			
	Data management			
	Data ownership			
	Data quality			
	Data retrieval			
	Data sharing	Data exchange		
	Definitive data	Well-defined data		
27. Decision making				
28. Definition	Well-defined			
29. Desirable	Highly desirable			
30. Developmental sustainability				
31. Devolved responsibility				

UofA Top Terms	UofA second layer	UofA third layer	UofA fourth layer	UofA fifth layer
32. Dialogue				
33. Difficulties				
34. Discussion				
35. Effective				
36. Efficient				
37. Embedded				
38. Essential				
39. Evaluation				
40. Evolving				
41. Exceptional	Exceptional nature			
42. External environment				
43. Faculty services				
44. Finance	Cost effectiveness	Value for money		
	Financial analysis			
45. Flexibility				
46. Functionality	Good functionality			
	Increased functionality			
	Required functionality			

UofA Top Terms	UofA second layer	UofA third layer	UofA fourth layer	UofA fifth layer
47. Good	Good practice			
48. Harmonising	Harmonising approaches			
49. Holistic viewpoint				
50. Implementation	Implementation and review			
	Success factors			
51. Importance				
52. Information	Information accuracy			
	Information base			
	Information environment			
	Information in its own right			
	Information integration			
	Information management	Information access		
		Information availability		
		Information co-ordination		
		Information collection		

UofA Top Terms	UofA second layer	UofA third layer	UofA fourth layer	UofA fifth layer
		Information commonality		
		Information communication		
		Information control		
		Information costs		
		Information creation		
		Information dissemination		
		Information exchange		
		Information extraction		
		Information generation		
		Information linkage		
		Information location		
		Information maintenance		
		Information manipulation		
		Information organisation		

UofA Top Terms	UofA second layer	UofA third layer	UofA fourth layer	UofA fifth layer
		Information ownership		
		Information presentation		
		Information processing		
		Information provision		
		Information relevance		
		Information resources		
		Information responsibility		
		Information *retrieval*		
		Information standards		
		Information storage		
		Information structuring		
		Information transmission		
		Information updating		
		Information usage	Information utilisation	

UofA Top Terms	UofA second layer	UofA third layer	UofA fourth layer	UofA fifth layer
		Internal communication		
	Information services			
	Information strategy			
	Information systems			
	Information type			
	Informational role			
	Management information			
	University information			
53. Information study				
54. Infrastructure	Hardware infrastructure			
	IT requirements			
55. Integration	Integrated systems			
56. Interaction				
57. Involvement				
58. Issues	Concerns and issues			
59. Knowledge	Knowledge dissemination			
	Knowledge manipulation			

UofA Top Terms	UofA second layer	UofA third layer	UofA fourth layer	UofA fifth layer
60. Learning technologies				
61. Local	Local data			
	Local modifications			
	Local needs			
	Local planning			
62. Management and distribution				
63. Mission and vision				
64. Monitoring				
65. Needs	Competing needs			
	Identified needs			
	Overlapping needs			
	Specific needs			
	Teaching and learning needs			
66. Planning	Detailed planning			
	Planned			
	Structured planning			
67. Policy	Learning and teaching policy			
	Policy issues			

UofA Top Terms	UofA second layer	UofA third layer	UofA fourth layer	UofA fifth layer
68. Priorities				
69. Procedures				
70. Projects	Academic quality project			
	Administrative information systems	Management information systems		
	Alumni project			
	Asset register			
	Central databases project			
	Classroom upgrade project			
	Course management systems project	Online student registration		
	Data warehouse project			
	Document management	Doc management system project		
	Generic project details	Project benefits		
		Project completion		

UofA Top Terms	UofA second layer	UofA third layer	UofA fourth layer	UofA fifth layer
		Project complications		
		Project deadline	Project deadline unrealistic	
		Project delay		
		Project desirable		
		Project enhancements		
		Project essential		
		Project evaluation		
		Project finance	Decreased finance given	
			Project increased cost	
		Project highly desirable		
		Project implications		
		Project interconnectedness		
		Project issues	Utilisation issue	
		Project limitations		
		Project maintenance		
		Project monitoring		

UofA Top Terms	UofA second layer	UofA third layer	UofA fourth layer	UofA fifth layer
		Project objectives	Achievable objectives	
		Project pilot		
		Project problems		
		Project purpose	Project planning	Project modifications
				Project rationale
			Project proposal	
			Project recommendation	
		Project resources	Insufficient resources	
			Resource planning	Resource control
				Resources revised
				Sufficient resources
		Project responsibility		
		Project risk		
		Project schedule		
		Project specification		

UofA Top Terms	UofA *second* layer	UofA *third* layer	UofA *fourth* layer	UofA *fifth* layer
		Project sponsorship		
		Project status		
		Project success factors		
		Project working groups		
		Timetable for replacement		
	Project G*	Accommodation project		
		Admissions applications		
		Finance project		
		Online examination project	Online awards project	
		Payroll project		
		Personnel project		
		Research system project		
		Student record system		
	Groupware project	Managed learning environment		
	Intercampus ICT links project			

UofA Top Terms	UofA second layer	UofA third layer	UofA fourth layer	UofA fifth layer
	Laptops leasing project			
	Library replacement system project	Voyager project		
	Marketing project			
	Network project	CWIS		
		Multi-media networking project		
		Student residences project		
	NT upgrade project			
	Online clearing			
	Online timetabling project			
	PC upgrade project			
	Service levels project			
	Smart card project			
	Student emails project			
	Video conferencing project			
	Virtual reality project			
	Web-site project	Web site specifics		

UofA Top Terms	UofA second layer	UofA third layer	UofA fourth layer	UofA fifth layer
	Wisdom project	Faculty intranets		
		Staff intranet project		
		Student intranet project	Student profile project	
71. Quality				
72. Realistic ideas				
73. Reliable	Reliable and effective			
74. Resistance				
75. Review				
76. Roles and responsibility				
77. Secure	Security			
78. Size and sophistication				
79. Stakeholders	External stakeholder	External viewpoint	Appearance to the outside	
	Representative stakeholders			
	Staff issues			
	Stakeholder apathy			
	Stakeholder collaboration			
	Stakeholder concern			

UofA Top Terms	UofA second layer	UofA third layer	UofA fourth layer	UofA fifth layer
	Stakeholder conflicts			
	Stakeholder endorsement			
	Stakeholder identification			
	Stakeholder input			
	Stakeholder interest			
	Stakeholder involvement			
	Stakeholder liaison			
	Stakeholder linkages			
	Stakeholder needs			
	Stakeholder resistance			
	Stakeholder tension			
	Stakeholder understanding			
	Use input			
80. Strategy	Special strategy issues			
	Strategic cohesiveness			
	Strategic cost			
	Strategic credibility			

UofA Top Terms	UofA second layer	UofA third layer	UofA fourth layer	UofA fifth layer
	Strategic decision making			
	Strategic initiative			
	Strategic objectives			
	Strategic plan	Strategy progress		
	Strategic policies			
	Strategic priorities			
	Strategic recommendations			
	Strategic view			
	Strategy alignment			
	Strategy alternatives			
	Strategy approval			
	Strategy dates			
	Strategy development			
	Strategy dissemination			
	Strategy documents			
	Strategy implementation			
	Strategy implications			

UofA Top Terms	UofA second layer	UofA third layer	UofA fourth layer	UofA fifth layer
	Strategy rationale			
	Strategy review			
	Strategy update			
81. Success - lack of				
82. Systems	Extending systems			
	Present system			
	Proven systems			
	System compatibility			
	System specification			
	Systems benefits			
83. Targets	Attainable targets			
	Realistic targets			
84. Updating				
85. Well organised				

TABLE A4.2: Full Listing Of All Terms In Document Indexer For Uofb

UofB top term	UofB second layer	UofB third layer	UofB fourth layer
1. Aims and objectives			
2. Business drivers			
3. Change	Barriers to change		
	Breadth of change		
	Business change drivers		
	Change overload		
	Change potential		
	Depth of change		
	External change		
	Speed of change		
4. Communication	Communication issues		
5. Competition	Competitive advantage		
	External competition		
6. Complexity			
7. Constraints	Barriers to success		
8. Consultation			
9. Critical success factors			
10. Culture	Cultural issues		

UofB top term	UofB second layer	UofB third layer	UofB fourth layer
	Culture change		
11. Data	Data accuracy		
	Data centralisation		
	Data completeness		
	Data conflict	Database incompatibilities	
		Multiple databases	
	Data duplication		
	Data inaccuracy	Data ambiguity	
		Data missing	
	Data integrity		
	Data quality		
	Data standards		
	Data up-to-date		
	Data variances		
12. Decision making	Consistency of decision making		
	Realistic decisions		
13. Effective			
14. Efficient			
15. Environment	Environmental factors		

UofB top term	UofB second layer	UofB third layer	UofB fourth layer
	Environmental scanning		
	Evolving environment		
16. Finance	Competing financial demands		
	Cost benefits		
	Cost effective		
	Cost minimisation		
	Cost reduction		
	Financial control	Budgetary control	
	Financial planning		
	Investment	Investment cost	
		Investment issues	
	Value for money		
17. Flexibility			
18. Framework			
19. Holistic view			
20. Information	Disinformation		
	Effective information		
	Information concerns		
	Information control		

UofB top term	UofB second layer	UofB third layer	UofB fourth layer
	Information lack		
	Information requirements		
	Information responsibility		
	Information sharing		
	Information strategy		
	Management information		
	Reliable information		
	Timely information		
	Unreliable information		
	Up-to-date information		
21. Information Technology	IS/IT control		
	IS/IT prioritisation		
	IS/IT provision		
	It commercialisation		
	IT development		
	IT faculties		
	IT failure		
	IT infrastructure		
	IT integration		

UofB top term	UofB second layer	UofB third layer	UofB fourth layer
	IT investment		
	IT role		
	IT support		
	Technological implications		
	Technology issues		
22. Integration	Issues to integration		
	Non-integration		
23. Knowledge lack			
24. Mission			
25. Organisation	Organisational difficulties		
26. Performance	Performance improvement		
	Performance monitoring		
27. Planning	Iterative planning		
28. Policies			
29. Principles			
30. Projects	LRCs		
	Project benefits		
	Project characteristics		
	Project constraints		

UofB top term	UofB second layer	UofB third layer	UofB fourth layer
	Project cost		
	Project decisions		
	Project delay		
	Project development		
	Project finance		
	Project functionality		
	Project implementation		
	Project implications		
	Project issues		
	Project needs		
	Project opportunities		
	Project plan		
	Project priority		
	Project requirements	Complex requirements	
		Evolving requirements	
		Far reaching requirements	
		Future requirements	
	Project resources		
	Project responsibility		

UofB top term	UofB second layer	UofB third layer	UofB fourth layer
	Project roles		
	Project savings		
	Project selection		
	Project specifications		
	Project success		
	Project support		
	Project timescales		
	Software upgrade		
	Staff development project		
31. Quality			
32. *Resources*			
33. Risk management			
34. Rules and regulations			
35. Secure			
36. Stakeholders	External stakeholder		
	Internal stakeholders		
	Stakeholder expectations		
	Stakeholder involvement		
	Stakeholder issues		

UofB top term	UofB second layer	UofB third layer	UofB fourth layer
	Stakeholder management		
	Stakeholder requirements		
	Stakeholder understanding		
	Understanding stakeholders		
37. Standards	Development standards		
38. Strategy	Communication strategy		
	IS/IT strategy		
	Organisational strategy		
	Strategic direction		
	Strategic planning		
	Strategy consistency		
	Strategy continuous review		
	Strategy lack		
	Strategy success		
	Strategy updating		
39. Supporting			
40. System	Application linking		
	Application systems	Applications eg WP	
		Central database system	

UofB top term	UofB second layer	UofB third layer	UofB fourth layer
		Communications system	
			Broadcast system
		CrackIT	
		Document management system	
		Electronic campus	
		Estates system	
		External information systems	
		Finance system	
		Groupware	
		Learning system	
		LR system	
		MIS	
		Multi media project	
		Pay/personnel system	
		Project Hercules	
		Purchasing system	
		Quality system	
		Smart card project	

UofB top term	UofB second layer	UofB third layer	UofB fourth layer
		SRS	
		Student advice system	
		Timetabling system	
	Documented systems		
	Integrated systems		
	IS services		
	Missing systems		
	Planned systems		
	Strategic systems		
	Structured systems		
	System centralisation		
	System compatibility		
	System developments		
	System enhancements		
	System goals		
	System implementation		
	System integration		
	System needs		
	System problems		

UofB top term	UofB second layer	UofB third layer	UofB fourth layer
		System requirements	
		System search	
		System upgrades	
		User requirements	
41. Trust			
42. Usability			
43. Work aspects			

TABLE A4.3: Identical Top Terms:

UofA terms	UofB top term	UofA % terms used	UofB % terms used
Changes/changing	Change	4.58	6.83
Communication	Communication	.7	3.73
Competition	Competition	2.56	1.24
Complexity	Complexity	2.11	3.73
Consultation	Consultation	8.46	7.45
Data	Data	5.55	10.56
Decision making	Decision making	1.59	3.11
Effective	Effective	2.47	3.73
Efficient	Efficient	2.2	.62
Finance	Finance	2.73	13.66
Flexibility	Flexibility	2.38	1.24
Holistic viewpoint	Holistic view	.18	.62
Information	Information	20.26	12.42
Integration	Integration	3.52	4.35
Knowledge	Knowledge (lack)	.26	3.11
Mission and vision	Mission	1.59	4.35
Planning	Planning	1.76	1.24
Policy	Policies	.7	.62
Projects	Projects	52.69	25.47
Quality	Quality	1.32	1.24
Secure	Secure	1.5	1.24

UofA terms	UofB top term	UofA % terms used	UofB % terms used
Stakeholders	Stakeholders	34.19	22.98
Strategy	Strategy	15.86	20.5
Systems	System	1.59	42.24

TABLE A4.4: Terms Used In Uofa – Frequency Of Attachment To Text Fragments

Term	Number of mentions as % of total text fragments	
Accessibility	16	1.41%
Ad hoc activities	1	0.09%
Adapting procedures	1	0.09%
Administrative functions	3	0.26%
Advantage IS delivery	1	0.09%
Advertisement	1	0.09%
Approach	1	0.09%
Appropriate	25	2.20%
Assumptions	5	0.44%
Centralised	1	0.09%
Challenges	7	0.62%
Changes/changing	52	4.58%
Co-operation	8	0.70%
Co-ordination	15	1.32%
Coherent	2	0.18%
Committee	117	10.31%
Communication	8	0.70%
Competency	7	0.62%
Competition	29	2.56%

Term	Number of mentions	as % of total text fragments
Complexity	24	2.11%
Comprehensive	9	0.79%
Confidentiality	2	0.18%
Consultation	96	8.46%
Continuing/continuous	25	2.20%
Current practice	2	0.18%
Data	63	5.55%
Decision making	18	1.59%
Definition	15	1.32%
Desirable	9	0.79%
Developmental sustainability	1	0.09%
Devolved responsibility	1	0.09%
Dialogue	1	0.09%
Difficulties	2	0.18%
Discussion	1	0.09%
Effective	28	2.47%
Efficient	25	2.20%
Embedded	1	0.09%
Essential	9	0.79%
Evaluation	11	0.97%

Term	Number of mentions as % of total text fragments	
Evolving	30	2.64%
Exceptional	1	0.09%
External environment	4	0.35%
Faculty services	1	0.09%
Finance	31	2.73%
Flexibility	27	2.38%
Functionality	13	1.15%
Good	2	0.18%
Harmonising	9	0.79%
Holistic viewpoint	2	0.18%
Implementation	5	0.44%
Importance	1	0.09%
Information	230	20.26%
Information study	1	0.09%
Infrastructure	24	2.11%
Integration	40	3.52%
Interaction	3	0.26%
Involvement	6	0.53%
Issues	8	0.70%
Knowledge	3	0.26%

Term	Number of mentions as % of total text fragments				
Learning technologies	1	0.09%			
Local	16	1.41%			
Management and distribution	1	0.09%			
Mission and vision	18	1.59%			
Monitoring	3	0.26%			
Needs	21	1.85%			
Planning	20	1.76%			
Policy	8	0.70%			
Priorities	11	0.97%			
Procedures	2	0.18%			
			Project mentions		
Projects	598	52.69%	Administrative quality	3	1%
Quality	15	1.32%	Administrative information system	130	22%
Realistic ideas	2	0.18%	Alumni	1	0%
Reliable	21	1.85%	Central databases	5	1%
Resistance	1	0.09%	Course management	18	3%
Review	2	0.18%	Data warehouse	13	2%
Roles and responsibility	1	0.09%	Document management	15	3%
Secure	17	1.50%	Accommodation	6	1%

Term	Number of mentions as % of total text fragments				
Size and sophistication	7	0.62%	Admissions	5	1%
Stakeholders	388	34.19%	Finance	42	7%
Strategy	180	15.86%	Online exams	5	1%
Success - lack of	1	0.09%	Payroll	15	3%
Systems	18	1.59%	Personnel	34	6%
Targets	3	0.26%	Research	25	4%
Updating	2	0.18%	SRS	36	6%
Well organised	2	0.18%	Groupware	19	3%
			Library	7	1%
			Marketing	7	1%
			Timetabling	10	2%
			Smart card	60	10%

Figure A4.1: A Sample Term Tree to Five Levels for UofA

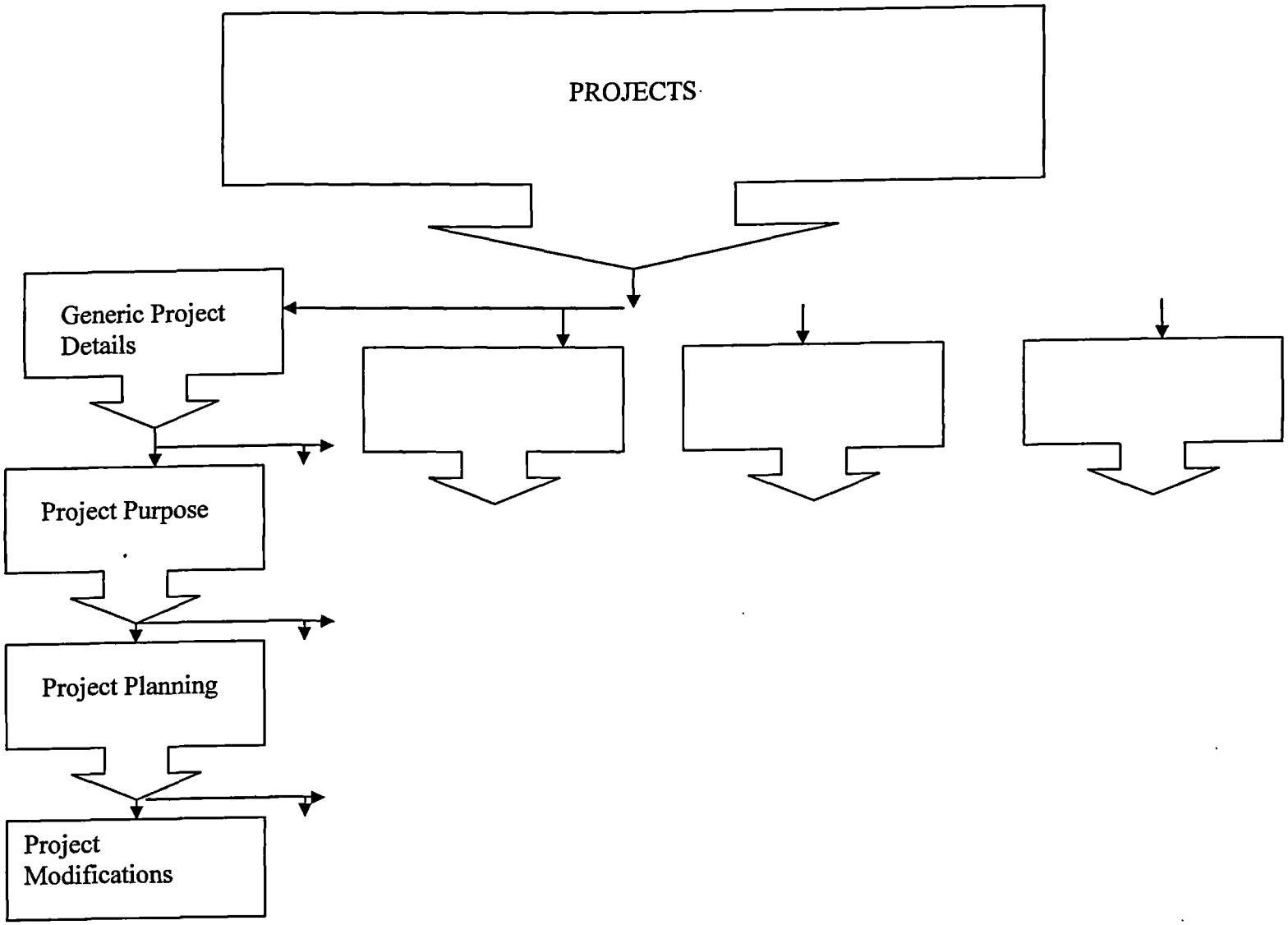
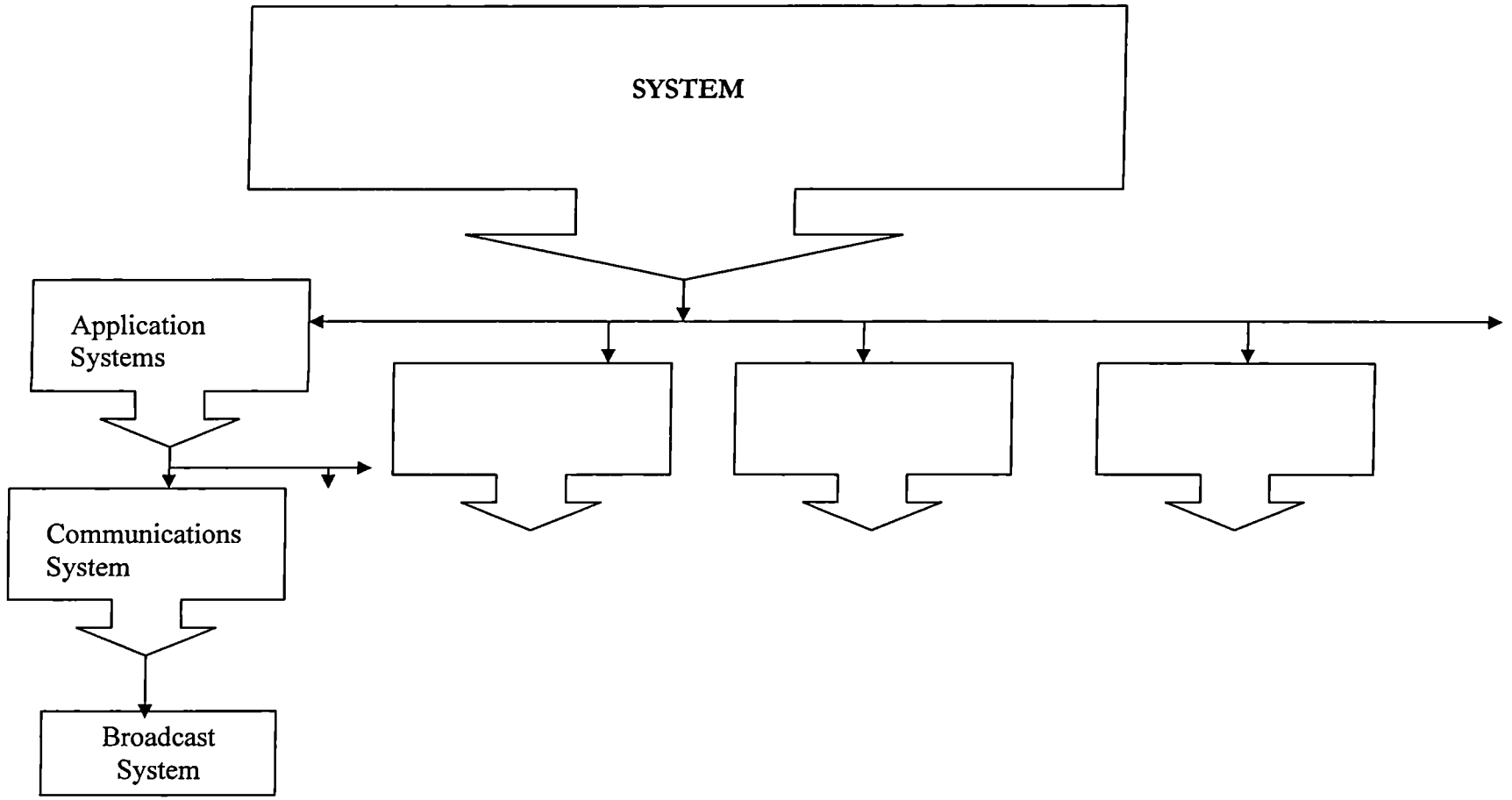


Figure A4.2: A Sample Term Tree to Four Levels for UofB



APPENDIX FIVE

Table A5.1 Analysis of UofA and UofB along Earl's typologies of organisation

	Business-led	Method driven	Administrative	Technological	Organisational	UofA	UofB
Emphasis	Business	Technique	Resources	Model	Learning	Business led	Administrative
Basis	Business plans	Best method	Procedure	Rigor	Partnership	Business led	Administrative and business
Ends	Plan	Strategy	Portfolio	Architecture	Themes	Mixture of administrative, technology, and organisational	Administrative, business, method
Methods	Ours	Best	None	Engineering	Any way	Business led	None
Nature	Business	Top-down	Bottom-up	Blueprints	Interactive	Method driven	
Influencer	IS planner	Consultants	Committees	Method	Teams	Administrative	Committees, consultants
Relation to business strategy	Fix points	Derive	Criteria	Objectives	Look at business	Administrative and organisational	

	Business-led	Method driven	Administrative	Technological	Organisational	UofA	UofB
Priority setting	The board	Method recommends	Central committee	Compromise	Emerge	Administrative	Committee
IS role	Driver	Initiator	Bureaucrat	Architect	Team member	Technological	Technological
Metaphor	It's common sense	It's good for you	Survival of the fittest	We nearly aborted it	Thinking IS all the time	Method driven	Administrative
Under pinning assumption	Business plans and needs should drive IS plans	IS strategies will be enhanced by use of a formal SISP	SPIS should follow and conform with the firm's management planning and *control procedures*	SPIS is an exercise in business and information modelling	SPIS is a continuous decision-making activity shared by the business and IS	More Business-led than Administrative	Administrative – with some business led
Emphasis of approach	Business leads IS and not vice versa	Selection of the best method	Resource planning and steering committees	Modelling method employed	Permanent and ad hoc teams of key managers including IS	Administrative – many committees	Administrative – lots of committees
Major influence of outcome	IS planners	Practitioners of the method	Resource planning and steering committees	Modelling method employed	Permanent and ad hoc teams of key manager s including IS	Administrative	Administrative

	Business-led	Method driven	Administrative	Technological	Organisational	UofA	UofB
Slogan	Business drives IS	Strategy needs method	Follow the rules	IS needs blueprints	Themes with teams	Business	Business

Table A5.2 Weaknesses for each planning approach (taken from Earl 1999)

	Business-led	Method driven	Administrative	Technological	Organisational
Weaknesses	* Ad hoc method * Lacks management commitment * Depends on quality of business strategy	* User involvement * Too influenced by method * Implementation unlikely	* Non-strategic * Bureaucratic * Resource-constrained	* Lacks management support * Only partial implementation * Complexity	* Generation of multiple new themes * Soft methodology * Architecture becomes difficult

APPENDIX SIX

Example of a Narrative Story

THE SCHOOL DIRECTOR

AI is a very strong character with strongly held beliefs and an intense determination. She had been at UofB for some I5months at the time of the interview and was dismayed by the level of internal politics that caused, in her opinion an amount of misinformation, backbiting, and disruptive and destructive behaviour. During her time at the university there had been too much change, too fast and too much acceptance by the senior management team of this.

Her role included responsibility for the Learning Resource Centre.

She was not a direct user as yet of the central administrative system which in her view was inadequate with poor algorithms and slow and old technology. She was in favour of scrapping the existing system and re-starting afresh. She felt that the current system was hampered by its structuring due to its need to match HESA requirements. This central system was the root of a large number of administrative problems in the university. It caused a large wastage of people resources and a great deal of frustration amongst its users. She also felt that were some issues relating to data entry quality and possibly the standard of staff used. Reports produced by the system were inadequate or incorrect. The whole system of MIS across the university was a 'nightmare'. It was unfriendly to the user with unintelligent interfaces.

AI felt strongly that security and the conflict between public or private data were not fully addressed by the university's systems.

AI identified the community as being a stakeholder in the university 'even the guy on the next table is a stakeholder' – the university was an integral part of, and responsible to, the wider environment. Her views on stakeholding were very fluid and she saw the boundary as being permeable and that the university and its systems were part of the wider system. Ultimately everyone was a stakeholder.

She especially listed:

- Anyone who has a vested interest – or is an interested party even through an indirect relationship;
- Herself;
- Registry;
- Finance;
- Student union;
- Security staff;
- Health and safety;
- Academic staff.

APPENDIX SEVEN

Document Indexer Report on UofA Data Issues

Text fragments found by trace

date	document	page	para. line
text fragment			
	attached terms	reason	
	appropriate consultation		
	committee		
	local		
	data maintenance		
	data control		
	data ownership		
26/10/94	**d70**	2	3 c

Q. how will the need to view data as a corporate resource march with the need for confidentiality?
A. Students will not have full access to the admin systems but may possible have access to relevant data.

stakeholders
student record system
data
data confidentiality
data as a resource

27/10/94	**m14**	1	94 30.2

Security / confidentiality of data had been a frequent source of anxiety

stakeholder concern
data management
data security
data confidentiality

01/05/95	**wp2**	1	2 1

data means information in a form in which it can be processed automatically.

definition
data

19/02/96	**m23**	2	96 1

the issues of access to and control of data remained to be resolved.

data
data access
data control
issues

01/04/96	**rii**	7	12 1

Although much thought has been given to the type of information to be handled by the systems, it has not been possible, as yet, to make firm recommendations regarding such questions as the ownership of the data, its organisation and likely retrieval mechanisms. This will be part of the implementation plan.

project implementation
information
data
data ownership
data retrieval
information type

01/05/98	**in36a**	3	442

On-line telephone directory:
An NT database server was being installed the system would eventually be integrated with the Genesis Personnel system. Data held in the Genesis Oracle database would be made available to certain users....
Eventually we should move towards a data warehouse...

data warehouse project
NT upgrade project
genesis project
personnel project
project interconnectedness
data sharing

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