STRATEGIC ALIGNMENT AS A DETERMINANT OF INFORMATION SYSTEMS SUCCESS

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A thesis submitted in partial fulfilment of the requirements of the University of Wales for the degree of Master of Philosophy

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DECLARATION

I hereby declare that this dissertation is the result of my own work and that due reference is made where necessary to the work of other researchers and authors.

I further declare that this dissertation has not been accepted in substance for any former degree and is not currently submitted in candidature for any other degree.

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ABSTRACT

This thesis adopts the hypothesis that the development and communication of an information systems strategy aligned to the business strategy is a prerequisite to information systems success. This, it is argued, is achieved through the creation of a positive information systems culture within an organisation; i.e. a culture in which the development and application of consistent and meaningful critical success factors can take place.

There is a significant body of literature on information systems success and the importance of a strategic approach to systems procurement and development. The literature review explores the main themes, and establishes relationships between the creation of a positive information systems culture, strategic alignment, and past and current approaches to success measurement. What emerges from the literature is a failure of current measures to fully recognise the role of strategic alignment in the assessment and measurement of information systems success and its influence upon organisational culture.

The case study adopts a multi-method approach to data gathering. Questionnaires are used to investigate group differences when considering what is important to information systems success. Those differences that transpire are then more thoroughly examined via in-depth semi-structured interviews with senior managers representing those groups. A number of key themes, sub themes and issues surfaced from the qualitative analysis, and are presented and discussed individually in the context of the literature review.

It is concluded that the differences that exist between the users and developers of information systems preclude any meaningful application of the critical success factor method. It is further concluded that the process of aligning the development of information systems to the business strategy can facilitate the development of a positive information systems culture, where common terms of reference can be developed that define those factors that constitute success.

Finally, a model for information systems success is proposed that addresses many of the key themes that emerge from the research and which may form the basis for research in the future. The model employs the structure of a building as a metaphor for those elements that constitute information systems success and the relationships
between them. It identifies three components that form the foundation for success: continuous multi-disciplinary education and development, a business strategy, and communication. This foundation supports the information technology and business professionals who act as the pillars to the building and provide the integrity of the whole structure. They also support the roof – the information systems strategy – both pillars being equally important in their supportive role.
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1 INTRODUCTION

1.1 Background

Up until 1993, the author had spent 16 years working in Information Systems (IS) and Information Technology (IT). He had worked in the public utilities as a computer operator, programmer, and systems analyst, a London merchant bank as a programmer, and the software supply sector as a project manager and product manager. He had therefore covered aspects including computer operations, software design and programming, systems design and implementation, sales and management.

During this time, he had been aware of a wall existing between the IS/IT supply side and their customers, and whilst this barrier was often good-natured (although not always), it was always destructive, an element of mistrust invariably underpinning most interaction. Much of the problem seemed to be due to the view from both sides that IT was separate from the
business; something to be imposed by a group of specialists upon an
unwitting user base, who – no matter how hard they tried – could not make
these specialists understand what they really wanted.

This was the 1980s; a time where there was a preponderance of bought-in
packages which were difficult to fit into the existing set-up; a demoralised
central DP [data processing] department; fragmented IT usage throughout;
and users who were unable to identify business direction or where IT fitted in

It is not difficult to see why bricks existed within the wall. During the
author’s whole career in the industry, the focus of any personal training and
development had always been technical. Even as a systems analyst and
project manager, business and organisational knowledge had invariably been
gained by exposure – almost by osmosis – rather than by any positive
structured action by himself or his employers. It was also very rare for there
to be any cross-fertilisation of knowledge of IT to the customer base. The IT
organisation were the specialists, often housed in purpose-built buildings, or
inaccessible behind security doors, and it was their job to implement what
they believed to be the best solution for the customer.

Ultimately, it was very rare for the implementation of a new information
system to be considered a success. The IT suppliers would complain of such
issues as a lack of specialist staff, inadequate definition of user requirements,
and customer resistance to IT; the customer would likewise complain of
project overruns, disappointing equipment performance, cost overruns, and
inadequate training. Looking back, it is evident that many of the problems
were due to poor communication and a lack of a common understanding of what constituted success.

It came as rather a surprise to discover that in the context of this research not a great deal has changed. Systems were still fragmented, IT specialists demoralised, and customers still unable to effectively communicate their wants and needs.

1.2 The Study – Empirical Underpinning

Before stating the aims and objectives of the study, it is necessary to indicate how the literature review and preliminary work have led to their formulation. The study explores the role of the strategic alignment process in determining IS success. Until recently, much of the emphasis had been upon technical and semantic factors, the aim being to measure User Information Satisfaction (UIS) using critical success factors (CSFs). However, research now recognises the importance of strategically aligning information systems if they are to be successful. Writers, such as Karake (1997) and Tomlin (1991), describe the increasingly turbulent nature of the business environment and how this change is forcing corresponding change in management, organisation, and philosophy. This change they argue, will lead to the development of a positive IS culture where common vision and values are derived from a strategic planning process, and where communication, understanding and trust exists between the business and IS organisations. Only then, they propose, can IS be successfully deployed as a strategic weapon.
CHAPTER 1

It is the authors' belief that existing measures of IS success that are based upon CSFs do not reflect the widening scope of IS and the growing interdependence between organisational business strategy rules and procedures and the organisation's IS/IT. Instead, CSFs focus upon and reinforce the barriers between technical and behavioural approaches to IS. Laudon and Laudon illustrate this 'bringing together' of the technical and behavioural by suggesting that:

"...technology must be changed and redesigned in such a way as to fit organisational and individual needs. At times the technology may have to be 'de-optimised to accomplish this fit. Organisations and individuals must also be changed through training, learning and planned organisational change in order to allow the technology to operate and prosper".

(Laudon & Laudon, 2000 pp13-15)

Figure 1 depicts this point of convergence between the organisation and the technology.

Figure 1 – Point of convergence between the organisation and the technology
More recently, this appreciation of integration and organisational issues has been supported by surveys cited by Doherty and King (1998) and Fitzgerald (1998).

This research uses a case study approach to explore the role of the strategic alignment process both in assessing information success and in overcoming the barriers to developing a positive information systems culture within organisations. Justification for both the subject and method comes from Galliers (1993), who argues that when reviewing the studies that have been undertaken to identify key issues facing information systems managers, it is those concerned with integrating information systems considerations with business strategies that are of key concern. This however is in the context of research activity that is primarily focused upon technical issues. He also stresses the greater use of laboratory experimentation among researchers, at the expense of case and field studies, which he argues to have more utility to the management and utilisation of IT in organisations.

1.3 Statement of Aims and Objectives

From this preliminary research the following aims and objectives have been formulated:

Aim:

To explore the suitability of “traditional” measures of information systems success for contemporary business organisations.
Objectives:

To understand the organisational culture characteristics of a large dispersed organisation and how they inform and influence the use of critical success factors in assessing information systems success.

To examine the relationship between the IT and business organisations in order to understand the nature and causes of any conflicts and barriers to the development of a positive organisation-wide IS culture.

Aim:

To determine the role of the strategic alignment process in determining IS success.

Objectives:

To understand to scope of strategy penetration and perception within the organisation.

To identify the attributes or features of both the process and consequence of the strategic alignment process that may determine its suitability as an indicator of IS success.

1.4 The Research Hypothesis

It is felt that whilst the aims and objectives provide an empirically underpinned framework upon which the case study can be explored, a research hypothesis can provide a focus – a defining statement that provides a point of convergence for the conclusions. The following research hypothesis is therefore stated:

Strategic fit is the dependent variable of information systems success.
This concise hypothesis offers the opinion that CSFs are no longer relevant as the ultimate definition of IS success, that the emphasis upon user satisfaction – whilst important – is not the defining factor. Only by a process of strategically aligning the development of IS with the strategy of the business can the cultural and organisational conditions – an organisational behaviour - be created in (and by) which a common notion of what is important and what constitutes success be formed.

1.5 The Case

It was decided to undertake a case study within a large service organisation based in the UK. The chosen organisation was a blue-chip business, running a number of international airports both in the U.K. and abroad, and employing some 8000 staff. The choice was one initially of practicality, as initial contact could easily be made through the external supervisor of this research, but transpired to be ideal, as they were undergoing a significant cultural and organisational change with relation to their IS/IT. Many of their back-office systems had been procured during the 1980s and 1990s, with many of the problems associated with this era evident, and were now going through business process redesign (BPR), with a focus upon user involvement and strategic alignment. It would be interesting to explore perceptions and attitudes of key decision-makers in the context of this cultural shift.

1.6 Summary

The ever-increasing investment in IS by organisations worldwide means that it is becoming ever more important to justify expenditure in terms of the success of those IS. This case study will use the context of a large dispersed
blue-chip organisation to explore what constitutes IS success and how its determination is influenced by organisational issues such as culture and, in turn, behaviour. The study will then use this exploration, as a basis for determining the relevance and usefulness of CSFs as a method for determining IS success and the place of strategic alignment as a more effective alternative.
2 LITERATURE REVIEW

2.1 Defining the Context

This chapter explores and reviews the body of literature surrounding the chosen area of study. Firstly, a baseline definition of culture is established. This definition is then used to examine the organisational cultural response to the development and procurement of IS. The importance of a positive IS culture is then considered and offset against the barriers to the development of such a culture. The process, characteristics and consequences of strategic alignment are then explored in the context of IS cultural development. Finally, the Critical Success Factor approach to determining IS success is reviewed and its development and applications criticised.

2.2 Definitions of Culture

The concept of culture has been increasingly addressed in management literature since the early 1980s, particularly in the area of strategic change (Johnson, 1992; Stacey, 2000: 48-50; Rosen, 1995: 13). It is also often used as a variable to explain the troubled relationship between the IT organisation and the rest of the business (Grindley, 1991; Willcocks, 1991; Ward & Peppard, 1996). In order to understand the development of culture, and how it might impact upon the advancement and success of information systems
within an organisation, it is first necessary to understand what is meant by the word *culture*.

What is important, and can be seen as a foundation characteristic of culture, is that it is *learned*; it is not biologically inherited; an adult is not born with the genetic coding that requires them to eat roast beef and Yorkshire pudding on a Sunday. This behaviour is a cultural response to a number of converging factors learned over a long period of time, and built up over a number of generations. It is a common behavioural response, but one that will have variety even within a common culture, as each persons' experience will be different to some degree, the difference manifesting itself in varying rituals, importances, and actions surrounding this weekly event.

This baseline definition of culture - as a set of learned and evolving behaviours – has evolved over the years. Matthew Arnold (1869) placed the emphasis on *High Culture*, defining culture not merely as a scientific passion for knowledge, but with its origin in the love of perfection; a study of perfection driven by a force for doing good. This viewpoint saw the force moving the development of culture as the pursuit of a better world and “to make reason and the will of God prevail”. Arnold saw culture as “contact with the best that has been thought and said in the world”, and this rather elitist view of high culture has now been modified to mean the best which a culture has to offer, be it opera or football.

Raymond Williams (1958) moves further towards our baseline definition by moving from Arnold’s idea of ‘high culture’ to the idea that culture is ordinary. He argued that every human culture has its own shape, purposes,
and meanings, and that for a culture to establish itself, a common set of meanings and directions must be found, these elements then evolving and growing under active debate and experience. He went on to state that this process of establishment and growth takes place in each individual mind so that work, observation and communication are possible. In essence, Williams argued that culture has 2 driving forces in its development. Firstly, those meanings and directions that its members are trained to, and secondly the observations and meanings that modify the culture in light of experience.

From Williams’ work, the idea of culture and sub-culture, macro and micro culture, start to emerge, the idea that whilst cultures are established upon common elements, these elements are modified over time by experience, and experience is something that is either different in fact, or different by perception for formal and informal groups and individuals within cultures.

Clifford Geertz (1973), who defines culture as a system of meanings or a web of significance, that each person spins for themselves picks up this view. This web of significance is the relationship between one group of variables and the meanings attached to them, these variables being language, actions, or behaviours. In other words, it is our ability to arbitrarily assign symbolic meanings to variables that forms the basis of culture development. As Bodley (1994) argues, it is this ability that sets us apart from other animals. He goes on to state that culture is not biologically inherited, it is learned and that the ability to ascribe symbolic meaning that is an essential element in our systems of communication, making speech so productive and enabling us to think and behave profoundly creatively. However, it also dictates that culture is more than a set of rules guiding behaviour, as there is often a wide divergence
between what the rules dictate and what actually happens. Even so, Bodley
emphasises the shared aspect of culture and that it is essentially a social
phenomenon, and that idiosyncratic behaviour is not cultural. Nevertheless, it
should be recognised that variations and sub-groupings will occur at many
levels within a culture depending upon the shared and individual experiences
of those within it. This is particularly important when looking at
organisational culture and how it differs between those diverse groups or sub-
cultures involved in the development and use of information systems.

2.3 An Information Systems (IS) Culture

The turbulent and unpredictable nature of the business environment (Karake,
1997; Tomlin, 1991; Moreton, 1995, Doherty & King, 1998) has been an
increasingly potent driver of change within organisations, particularly in
terms of the information requirements of those organisations. The greater the
degree of turbulence, the more decision-making takes place, and the greater
the need for information to reduce uncertainty and risk associated with that
decision-making (Karake, 1997). It is generally accepted that IT can provide
the information required by management to be proactive in this environment
and can play a strategic role in creating competitive advantage, rather than
just reducing cost (Coulson-Thomas, 1991). This proactive, strategic
approach to the use of information is in stark contrast with the 1980s focus
upon efficiency systems, where the driving force and motivation for IS
development was the reduction of costs and internal efficiency (Wetherbe,
1988; Tomlin, 1991; Fitzgerald, 1988), often resulting in fragmented IT usage
(Willcocks, 1991) and a culture of sub-optimality (Ward & Peppard, 1996;
CHAPTER 2

Wetherbe, 1988). Tomlin (1991) argues that the change in the nature of the business environment is forcing changes in management organisation and philosophy in order to make the best strategic use of IT developments, and that this use of IT as a strategic weapon is critical to survival and success rather than a boiler room activity of business administration.

The concept of an IS-aware culture is proposed by Windeatt & Knox (1991), who suggest that environmental change requires a corresponding cultural change within organisations, and that business managers need to be more aware of the opportunities and strategic potential of IS and IT. Key to the development of an IS culture is the establishment of IS legitimacy of change and operation (Willcocks, 1991), where a working definition of the development and use of IS is established. The constitution of common values and visions derived from the strategic planning process, the sharing of behavioural norms and the development of a common language of IS development is seen as essential to the development of an IS culture (Tomlin, 1991; Willcocks, 1991; Windeatt & Knox 1991). Only by ensuring that barriers to communication and understanding are removed will IS be developed and IT applied that is truly strategic and ultimately successful.

2.4 Barriers to IS Culture

The perspective of culture as shared meaning and commonality has been suggested. However, Ward & Peppard (1996) argue that a hermeneutic approach to IS culture development involves “the mutual understanding of different peoples ‘frames of reference’ which guide their meaning” (Ward & Peppard, 1996: 52). So whilst the idea of “shared” or “common” elements
has been put forward, it is modified by the fact that we each have our own webs of significance (as discussed earlier) that modify our behaviour and lead to the formation of various levels of sub-culture within organisations, each with its own behavioural and linguistic norms. Nowhere is this more evident than the apparent cultural differences between IT developers and the business community. Ward & Peppard (1996) describes IT as “having a language of its own dominated by acronyms” (Ward & Peppard, 1996: 39). Moreton (1995) backs up this view, arguing that IS departments are often a specialist and elitist group that does not communicate well with the business (or it with them), thereby implying a failing of both groups to develop those common threads that are required for successful cultural development.

2.4.1 The Failure of the Business to Understand the Strategic Potential of IT.

Windeatt and Knox (1991) assert that it is a “truisim” that:

"An organisation’s ability to exploit IT is dependent on the extent to which its management understand how to apply IT to business advantage". (Knox, 1991).

They go on to argue that as well as needing to improve their awareness of the opportunities and consequences of the strategic use of IT, business managers also had to be able to articulate their business requirements in ways that their IT colleagues could understand. Two issues may be drawn from these arguments. Firstly, that business managers do not have the necessary knowledge to fully exploit the use of IT, and that secondly, this lack of knowledge leads to a breakdown in communication between the business organisation and the IT organisation. Ward & Peppard (1996) more recently
support this view, but emphasise the consequence of separateness, of compartmentalisation.

“Many managers are technically inept or averse, feel incapable of understanding – let alone managing – I.T., and in a great many instances this is by choice. They run the business while the I.T. organisation provides them with I.T. solutions” (Ward & Peppard, 1996: 38-39).

Tomlin (1991) backs this up by attacking many UK companies performance record in many of the critical cultural areas, including a “Lack of top management understanding of how I.T. contributes to the business” and “Inadequate appreciation by senior management of what is involved in successfully deploying I.T.” (Tomlin, 1991: 51-52). They are not alone in their criticism of business managers’ understanding of IT and its application within business. Willcocks (1991) puts a relatively slow adoption of I.T. in the 1980’s down to an absence of IT know-how at senior levels.

2.4.2 The Failure of IT to Understand the Needs of the Business

From their study at BA (British Airways as was), Windeatt and Knox (1991) also identify the need of the IT side to “improve their understanding of the business and to be able to explain technology in business terms” and that “both sides need to work together more effectively”. Tomlin (1991) takes a more emphatic stance, arguing that from the business point of view, IT professionals had manifestly failed to understand the business or understand organisational issues, leading to exacerbated relationships between IT specialists and general management (Tomlin, 1991). As Moreton (1995) states:
"It is equally a matter of IS management acquiring a deeper understanding of the business, appreciating what business and environmental factors are driving the business strategy, and relating them to technology issues" (Moreton, 1995: 158).

System developers must have a good understanding of the business (Neumann, 1994) and would have more chance of influencing strategic decisions if they could demonstrate a broader strategic awareness and external perspective, with an appreciation of the facilitative role of the technologies and processes in the broader organisational context (Coulson-Thomas, 1991). This view that IS professionals are unaware of strategic issues is disputed by Doherty & King (1998) who argue that IT professionals appreciate the importance of organisational issues, but do not have the time, resources or expertise to address them.

It seems then that a culture gap exists between those who have traditionally provided the IT solutions for business, and those who define the business requirements and ultimately use the systems. In terms of cultural development, the business side had already established its cultural norms when the IT organisation started, as they saw it, to impose their culture upon that business (Ward & Peppard, 1996), "a ‘forced’ rather than a ‘mutually desired’ marriage". The IT organisation, on the other hand saw their future in terms of the technology as a driver of systems, rather than as a contributor to business success. This focus upon the technology – the computer - almost as an end in itself led to an IT sub-culture, an elitist (Moreton, 1995) compartmentalised specialism (Wetherbe, 1988), its language perhaps reinforcing cultural exclusivity and separateness, rather than working toward
inclusiveness and co-operation. This separateness can be seen to lead to dysfunctional behaviour to the organisation (Ward & Peppard, 1996).

“No culture can live if it attempts to be exclusive” (Vitulo-Martin, 1994).

Poor relations between IT and the business has not been helped by the less than positive reputation of the IT organisation. A failure to meet deadlines, realise budget constraints, or ultimately satisfy user requirements are accusations regularly aimed at the IT organisation, general management perceiving a focus upon the technology rather then on delivering benefits to the organisation (Ward & Peppard, 1996). This would seem to be borne out by Remenyi et al (1997), who identify a tangible disparity between the investment in IT and the benefits derived, expenditure on IT growing by 350% during the 1980s, whilst productivity during the same period showing an increase of just 3-5%:

This view is echoed in a study by Clegg et al (1996), which concludes that 80-90% of IT investments fail to meet their performance objectives. Both writers highlight that the failure is not so much due to the technology, but a failure of management per se to understand the needs of the business and how IT can be used to best satisfy these needs.

2.5 The Issue of Culture – Summary

Laudon & Laudon (2000: 532) discuss the cultural characteristic of particularism by which the possibilities offered to businesses by globalisation are not realised due to judgements and actions being taken on the basis of narrow or personal characteristics. The literature would suggest that the
concept of particularism can be applied at an organisational level; 
organisational subgroups creating barriers to the development of a positive IS 
culture which, in turn, is a requirement for the strategic use of IS/IT.

The failure to develop a common culture of systems development, an IS 
culture, is likely to have grave consequences to businesses operating in an 
environment which is characterised by fast and continuous change (Remenyi 
et al, 1997), and defined by its variety, complexity, and uncertainty 
(Malhotra, 1997). As Harris (1990) states, “the nature of the business 
environment means that the top-down realisation of the business implication 
of I.T. can be regarded as the *sine qua non* of a successful I.T. strategy”.

2.6 Strategic Alignment – A Model for Success

The need for strategic alignment between IS and the business strategy is seen 
in the context of evidence indicating a strong link between business strategy, 
cites investigations carried out by the Sloan School of Management (Scott- 
Morton, 1990 in Burn *et al*, 1996)) which investigated the link between 
business strategy and IT. Of particular significance were findings relating to 
the future role of IT in organisations:

“IT does not provide sustainable competitive advantage by 
itself. It requires integration with the organisation’s processes 
and structure to achieve lasting advantage” (Scott-Morton, 

and
“IT capability is now of sufficient influence to become a driver to change the organisation, its processes, products and even its market” (Scott-Morton, 1990: 209-309).

What therefore is required is the determination of a strategic “fit” between the business and IS/IT, a process of examining the relationship between the choices that position a firm in the market and those that define the internal arrangements within the firm that are necessary to execute strategy, a process of strategic alignment.

Henderson & Venkatraman (1992) propose a strategic alignment model (figure 2) which illustrates the various relationships and linkages between strategy, infrastructure and processes, and the need to integrate at a strategic as well as a functional level.
“IT capability is now of sufficient influence to become a driver to change the organisation, its processes, products and even its market” (Scott-Morton, 1990: 209-309).

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The concept of creating a “strategic fit” between IS/IT applications and the business strategy has for a number of years been identified as an essential element for successful organisations (Lucas & Turner, 1982). Indeed, it may now be the case that IS/IT has evolved from its role of supporting and enabling the business strategy, to one where it plays a strategic role by creating competitive advantage rather than simply displacing cost (Karake, 1997; Fitzgerald, 1998; Burn, 1996). Burn sees this change as reflecting that the “Growing appreciation of the changing role of IS has highlighted the need to focus upon different approaches to IS planning which can more closely align the IS plans with the business plans” (Burn, 1996: 3).

Fitzgerald identifies a change in emphasis from “efficiency” projects, where the use of IT seeks to reduce the costs of a particular process, to “effectiveness” projects that seek to improve organisational effectiveness (figure 3). The change of emphasis from cost reduction to the
justification of IS in terms of the strategic benefits they bring to the organisation, stresses the importance of a common understanding between the IS organisation and the general management, of the needs of the business and the strategic potential of IT. IT is very good at making processes more efficient, particularly where the process consists of structured data being processed to a set of easily defined rules, and this type of application is much easier to justify in terms of the benefits it brings. It may then be argued that the prevalence of efficiency systems may in no small part be due to the cultural need of the IS organisation to be separate from the rest of the business. It has been able to function in isolation because its focus has been upon developing systems that, in IS terms, are easily understood and computerised, that are almost generic across all similar organisations. The
requirements for many systems, particularly back-office systems are functionally very similar from one organisation to the next. The IS organisation has therefore been able to concentrate upon the application of technology rather than being concerned with much softer problems relating to strategy. There is, and will always be a need for efficiency projects, but the need to justify those in terms of the business strategy is still essential in order to ensure that they are not sub-optimal, i.e. making a negative contribution, or having an unhelpful impact upon that strategy (Fitzgerald, 1998). Ultimately, it is the business strategy that determines priorities and allocates resources. It may also be argued that the business management has failed to develop a clarity of thought as to what objectives to pursue with regard to information technologies, viewing it as a “"boiler room’ activity presided over by unintelligible specialists”, and that this attitude has led to a lack of vision, with a focus upon cost minimisation and efficiency systems (Willcocks, 1991).

2.7 Establishing the Link between Culture and Strategic Alignment

The need to create a common vision of IS development in the context of a clearly defined and communicated strategy is gaining acceptance within the business community. Research carried out by Wilson (1991) asserts that:

"The formal link between the ISS [Information Systems Strategy] and the business plan was recognised by almost half the respondents with strategies, and, clearly that link may provide guidelines to preventing or overcoming problems in systems implementation" (Wilson, 1991: 43).
Neumann (1994) supports this view, stressing the emergence of a common vision based upon a clear statement of the future as being critical for successful IS.

Ward & Peppard (1996) speak of a “wall” existing between the IT organisation and the business management and that “culture is often used as a reason for this troubled relationship”. The results of a survey carried out by Grindley (1991) reported that IT Directors were well aware of the problem, stating that:

“Our main problem was the culture gap existing between the IT and business professionals; and its importance – 56% believe that the culture gap is inhibiting their companies from gaining competitive advantage from IT” (Grindley, 1991: 59).

Work carried out by Doherty & King (1998) also recognised that whilst many managers perceive organisational issues (of which issues of IS strategy alignment and organisational culture are included) to be more important than technical ones in determining the success of IS/IT developments, they are at best treating those issues implicitly, or in many cases, not at all. They go on to conclude that whilst concerned about the treatment of these issues, managers recognised that:

“….both the user and IT communities must grow closer together and become far more aware of each other’s requirements and motivators…..These findings also support Mumfords (1997) conclusion that there are still cultural barriers to be broken down before managers and users can fully participate with IS specialists in the systems development process” (Doherty & King, 1998: 121).
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It may be concluded from reviewing the literature that the development of an IS culture based upon a common goal of strategic alignment is critical to the success of IS within organisations today. However, strategic alignment is a process that has both quantitative and qualitative characteristics. Quantitative because it is an established process with a set of pre-determined, tangible deliverables; qualitative because of its potential for engendering cultural change and changes in organisational behaviour.

Commonly, Critical Success Factors (CSFs) have been used as instruments for the measurement of success of IS. This approach focuses upon identifying operational goals, the attainment of which lead to IS success. It relies upon a small number of strategic objectives that managers can easily identify and on which information systems can focus (Laudon & Laudon, 2000: 336). However, the application of CSFs in attempting to measure IS satisfaction tends to ignore this strategic focus, and as will be discussed in the following section, emphasise and reinforce the sub-optimal behaviours of the business and IT sub-groups.

2.8 Critical Success Factors.

Butler & Fitzgerald (1998) undertook a review of the CSF research since Rockart’s (1979) seminal paper. They define CSFs as the prerequisites or activities that lead to goal attainment, using an illustrative example put forward in the writings of Baron Von Clausewitz:

“.....the more competent and successful military commanders focused their available resources on the few battles of significance, whereas, the less competent commanders
dispersed their forces throughout the entire battle front”
(cited in Rockart, 1979).

Von Clausewitz termed this the principle of “concentration of forces”.

However, Butler and Fitzgerald recognise that the process of selecting CSFs is in itself a hermeneutic process of interpretation, whereby a common understanding is arrived at of those issues deemed to be important or problematic. This in itself is problematic when viewed in the context of the review so far. It is easy to see difficulties in establishing a common set of CSFs within an organisation that has no clear and common vision of its goals or strategies. Anthony et al (1972) reported that CSFs were different across organisations, and also between managers within the same organisation, and that these differences may be due to different perceptions or interpretations of the business environment.

There are many applications of and approaches to this use of CSFs in measuring IS success. A selection is reviewed next.

2.8.1 The Quest for a Reliable Tool – a review of CSF Research

The quest for a reliable tool for the measurement of information systems success has been one undertaken by numerous researchers. This has resulted in nearly as many measures as there are studies (DeLone & McLean, 1992).

However, the importance of this quest should not be understated. If strategies for IS implementation are to be assessed, it is essential that the dependent variable – information systems success – be measured with a high degree of reliability and consistency (DeLone & MsLean, 1992; Ives et al, 1983; Conrath & Mignen, 1990; Davis, 1989).
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Bearing in mind the plethora of research into this area, it is fortunate that a number of writers have critically reviewed this research and attempted to develop taxonomy of information systems success. Three particularly influential writers have been chosen to best reflect the development of the taxonomy over a period of time since the early 1980's. These are Ives et al, 1983; DeLone & McLean, 1992; Li, 1997.

Ives et al (1983) reviews information systems success in terms of user information satisfaction (UIS). They argue that “UIS provides a meaningful ‘surrogate’ for the critical but unmeasureable result of and information system, namely, changes in organisational effectiveness” (Ives et al, 1983).

This user-oriented measurement is common amongst researchers. It is important that Ives et al recognise the critical value of changes in organisational effectiveness, as it has already been understood that the results of the strategic alignment process are both quantitative and qualitative, and therefore difficult to measure. Nevertheless, as will now be discussed, the literature identifies an emphasis upon efficiency rather than effectiveness factors in attempting to measure UIS.

Ives et al review, in particular, four measures. Firstly, Gallagher's work on users' perceptions of the information value of reports provided by the IS (Gallagher, 1974). The questionnaire used by Gallagher had 2 types of questions. Firstly, managers were asked to estimate the dollar value of a report, and secondly to select semantic differential adjectives by which the managers rated the reports. Problems were identified with this measure in terms of its validity, reliability and repeatability. Ives also criticised the focus upon the product of the IS, i.e. the reports, and not upon the quality of service.
provided by the information services function. By criticising in this way, Ives then identifies an element of a much bigger problem. Satisfaction *per se* is a concept that is determined by many variables, and, in turn, these variables will be influence by factors such as business and organisational culture. In other words, each individual level of satisfaction will be decided by many factors. For a measure of UIS to be reliable it is therefore critical for to include as many of these variables as possible.

Secondly, the work of Jenkins and Ricketts (1979) is then scrutinised. They developed a 20-item measure of “user satisfaction”. These items were chosen to represent each of five factors defined as *a priori* as constituting user satisfaction; input procedures, systems processing, report content, report form, and report value. A 7-point Likert-type semantic differential scale was used. Testing proved the scale to be reliable. However, factor analysis failed to substantiate the structure. Ives identifies several limitations with this approach, initially citing the poor structure, but once again criticising it in terms of its narrow focus.

Thirdly, Ives reviews the work carried out by Larcker and Lessig (1980), which developed two 3-item scales, *perceived usefulness* and *perceived usability*. The convergent and discriminant validity of the two dimensions was analysed and established. Ives found several critical weaknesses with this method including a lack of empirical derivation of the scales, poor reliability, and questionable method. In common with the work reviewed above, Ives highlighted the narrow focus, that is the concentration upon the information systems product and the exclusion of such factors as service quality.
Lastly, the work of Bailey and Pearson (1983) is examined. They identify 39 distinct factors that contribute to information satisfaction, the factors being derived from an analysis of the literature, interviews and empirical evidence. The factors were used as the basis for an instrument using the semantic differential technique to establish the level of satisfaction and importance perceived for each one. Ives noted that there was adequate empirical support for this method, with reliability and correlation at an acceptable level and content and predictive validity being established (although Pearson did note that the content and reliability scores might have been overemphasised). Criticism was aimed not so much at the design, but at the execution of the procedures, i.e. the relatively small size and the dubious independence of the sample. However, Bailey and Pearson had moved away from a narrow focus to one that included both product and support.

Ives *et al* recognised Bailey and Pearson's work as being "an important first step toward the development of a valid UIS measure". Nevertheless, they suggested that further investigation was required to assess its reliability and validity, and to refine it for use in research and practice. In particular they identified four explicit goals of this investigation, two of which are:

- Reduce the length of the overall measure while maintaining reasonable levels of reliability and the existing structure of scales.

- Develop a standard "short form" of the instrument for research requiring only a global indicator of user information satisfaction.

It is a variation of this "short form" that is used to assess information satisfaction within this research (appendix 1).
2.8.2 A Taxonomy of IS Research

DeLone & McLean (1992) introduce a “comprehensive taxonomy” as a way of organising and analysing research into the concept of IS success. The common element that binds them all is that they provide a framework – a set of dimensions - within which researchers can develop critical success factors.

The taxonomy comprises six major dimensions or categories:

- Systems Quality.
- Information Quality.
- Use.
- User Satisfaction.
- Individual Impact.
- Organisational Impact.

They argue that the reason for the multitude of measures and studies is that when considering information in the context of a communication system, it can be measured at a number of different levels, including a technical level, a semantic level and an effectiveness level (Shannon & Weaver, 1949). Figure 4 illustrates the linear nature of the measurement process.
Mason modifies the model to reflect a “hierarchy” of influence events, from the production of the information, through evaluation and application of that information. It is from this model that DeLone and McLean yield their 6 dimensions or categories of IS success within which their review takes place:

2.8.2.1 System Quality

Within this category, some researchers have concentrated upon the physical characteristics of the processing system itself as a measure of IS success. Models of productivity and efficiency of hardware utilisation have been developed (Kriebel & Raviv, 1980; Alloway, 1980), as have indicators of response time, reliability, and ease of use (Swanson, 1974). These characteristics will certainly play their part in determining the level of UIS, frustration with poor response times or unreliable equipment being a familiar frustration to most; if not all IS users. They are also relatively easy to measure, being primarily quantitative, engineering-oriented characteristics.
2.8.2.2 Information Quality

DeLone and McLean cited the work carried out by Larcker and Lessig (1980) and Bailey and Pearson (1983) to illustrate the focus on IS products of this category. Particularly they identified that (whilst Bailey and Pearson also included service and influence factors in their instrument) the top 10 most important items contained that were product focused, i.e. information accuracy, output timeliness, reliability, completeness, relevance, precision, and currency. Work by writers such as Gallagher (1974), Ahituv (1980), Munro and Davis (1977), Swanson (1974), Zmud (1978), and King and Epstein (1983) have all added factors within this Information Quality dimension. These include relevance, usefulness, informativeness, importance, uniqueness, conciseness, freedom from bias, and decision relevance.

2.8.2.3 Information Use

DeLone and McLean's Information Use dimension encompasses those measures of the recipients consumption of system outputs. However, their analysis of the literature would appear to concentrate upon information systems use, the reasons that motivate individuals to use the system (Vanlommel & DeBrabander; Lucas, 1978; Welke & Konsynski, 1980; Maish, 1979), or the physical patterns of access and use, whether reported or actual (Swanson, 1974; Lucas, 1973; King & Rodriguez, 1978, 1981; Ginzberg 1981; Robey, 1979; Gremillion, 1984). This is in contrast to their dimension title – Information Use. Use implies how the outputs are used, not how the system is used to generate those outputs. Perhaps a better title would be Pattern of Information Consumption.
2.8.2.4 User Satisfaction

Within this dimension DeLone and McLean identify a shift away from the physical and usage characteristics of IS, towards one which attempts to measure how well IS meet the information needs of managers (Powers & Dickson, 1973). Many researchers work involved single attribute, or combinations of single attribute measures of user satisfaction such as use and user satisfaction (Ginzberg, 1981), or enjoyment and satisfaction (Lucas, 1981). Other researchers have proposed multi-attribute measures that use a combination of dimensions and factors to assess user satisfaction. These include the instruments devised by Swanson (1974) and Bailey & Pearson (1983). The review places an emphasis on work carried out by writers such as Igerhseim (1976) and Lucas (1978) that highlights the importance of user attitudes when assessing user satisfaction.

Further to this, Goodhue (1986) suggests “information satisfactoriness” – the degree of match between task characteristics and IS functionality as an antecedent to and replacement for user satisfaction.

What is clear from the literature is that user satisfaction is probably the most widely used measure of IS success. DeLone and McLean identify 3 reasons for this. Firstly, user satisfaction has a high degree of face-value, secondly, the Bailey and Pearson instrument has proved to be a reliable measure of user satisfaction and thirdly, the other measures are so poor, conceptually weak, or empirically difficult to obtain.
2.8.2.5 Individual Impact

DeLone and McLean identify Individual Impact as probably the most difficult to define. While the degree of positive impact relating to individual or departmental performance may be relatively straightforward to measure, perhaps in financial or efficiency terms, factors concerning decision-making productivity, resultant changes in user behaviour and the impact this has on organisational performance are much more ambiguous. As Lucy (1997) states:

"The value of information derives from the actions management take as a result of using the information", and it is the appreciation of this value, the "learning value of information" (Mock, 1971) that is of interest to researchers who use learning, or rate of performance improvement as a dependent variable" (Lucas & Nielsen, 1980).

Other frameworks for IS success within this dimension concentrate upon decision effectiveness as the dependent variable. This has been judged in terms of average time to make a decision (Benbasat & Deter, 1979, 1985; Benbasat and Schroeder, 1977; Chervany & Dickson, 1974; Taylor, 1975), speed of decision analysis (Sanders & Courtnay, 1985), the confidence in the decision made at an individual level (Chervany & Dickson, 1974; Taylor, 1975), or at a group level (DeSanctis & Gallupe, 1987), or change in decision behaviour (Mason, 1978; Ein-Dor, Segev, & Steinfield, 1981).

DeLone & McLean identify the estimation of IS worth as a instrument for measuring impact upon the individual. They cite Cerullo (1980) and Ronen and Falk who asked managers to rank the value of IS on a scale of one to ten. Researchers, such as Gallagher (1974) and Lucas (1978), took this approach a
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step further by asking managers to assign a dollar value to particular IS or reports generated by IS.

2.8.2.6 Organisational Impact

Discussions earlier in this chapter emphasise the potential importance of organisational impact – the effect of information on organisational performance – as a critical success factor of IS success. However, this variable has been largely ignored. Indeed, Galliers’ (1993) perceived misdirection of research activity has already been highlighted in the introduction (Section 1.2, p5).

This view is supported by research undertaken in the 1970s and 1980s that concentrated upon technical measures such as cost reduction and profit in assessing organisational impact (Dickson, Chervany, & Senn, 1977; King & Rodriguez, 1978, 1981; Remus, 1984). Others have used level of business, sales, or return on investment as yardsticks of organisational performance (Rivard & Huff, 1984; Lucas, 1973; Hamilton & Chervany, 1981; Garrity, 1981).

DeLone & McLean suggest the reluctance to address more socio-technical issues may be due to perceived difficulties in isolating IS effort from other variables that influence organisational performance.

More recently, the ability of IS to create or underpin competitive advantage has led to the development of a number of measures to assess not just performance, but the impact of IS upon industry structure. DeLone & Mclean identify work by Bakos (1987), and Chismar and Kriebel (1985) that attempts to quantify this impact, and suggest that
“....top management use judgement to assess the value of
benefits which are more difficult to quantify, such as
reduction of overhead, increases in customer switching costs,
barriers to new firm entry, and product differentiation”
(Johnson and Vitale, 1988).

In summary, DeLone & McLean suggest that research into Organisational
Impact as a dependent variable – a critical success factor – of IS success is
only a beginning, and it is in this area of “assessing the business value of
information systems” where much work needs to be done.

In their subsequent discussion, DeLone & McLean make the following
observations:

- As these research studies show, the IS researcher has a broad list of
  individual dependent variables from which to choose.

- Progress toward a MIS cumulative tradition dictates a significant
  reduction in the number of different dependent variable measures so that
  research results can be compared.

- Not enough MIS field study research attempts to measure the influence
  of the MIS effort on organisational performance.

- The six success categories and the many IS measures within each of
  these categories clearly indicate that MIS success is a multi-dimensional
  construct and that it should be measured as such.
They go on to propose a model of IS success (figure 5) that recognises IS success as a "process construct which must include both temporal and causal influences in determining I/S success". The model illustrates the limitations of much of the research that has gone before by representing the interdependent nature of the variables. For example, SYSTEM QUALITY and INFORMATION QUALITY singularly and jointly affect both USE and USER SATISFACTION, and USE and USER SATISFACTION are both mutually dependent.

![Figure 5 - IS Success Model (DeLone & McLean, 1992)](image)

Whilst previous research may have identified system quality or use as a CSF of IS success, it has failed to recognise this flow between the dimensions and consequently failed to provide a complete instrument for measuring or assessing IS success.

DeLone and McLean's 6 dimensions of IS success are critically reviewed by Li (1997). Li argues that DeLone and McLean's model concentrates on the systems aspect of IS success and ignores the human aspects. However, he suggests that the application of Bailey and Pearson's (1983) factors to the
model leads to the emergence of 2 new dimensions of IS success: Service Quality (the quality of support and service provided by the IS organisation) and Conflict Resolution (an examination of the relationship between the IS organisation and their customers). Within these (now 8) CSF dimensions, Li adds a number of new factors, which he suggests have been overlooked by Bailey and Pearson (1983). Perhaps most notably, the overall contribution of the CBIS [computer-based information system] to the organisational goals, a clear reference to strategic alignment.

So far within this review, the focus has been upon the hard or soft outputs from IS and how these have been used to develop a framework of critical success factors (CSFs) by which the level of success of IS projects can be measured. This focus has been set within the context of a dynamic business environment that is making demands upon organisational and business culture and how, in turn cultural characteristics influence the success of IS.

There are however two inputs to the process that are regularly cited as being critical to the successful implementation of IS.

2.8.3 "Top" Management Involvement and Support

The role of senior management and their commitment to the objectives of IS development are at the heart of organisational issues relating to IS failure or abandonment (Ewusi-Mensah & Przasnyski, 1994; Neumann, 1994). It is senior management that formulate strategy based upon the need for change, and it is management at all levels that need to communicate this need for change, along with the support for a strategic use of information and IS to support and enable this change (Wetherbe, 1988). A study carried out by
Wilson (1991) identified senior management involvement and board support as a factor leading to information systems success. Specifically he concludes that the degree of strong board level involvement is recognised as one of the major contributing factors to successful IS implementation.

It is not just involvement and support at a management level that interests researchers. User involvement is perhaps even more widely accepted as a precursor to IS success.

2.8.4 User Involvement in IS Development

Opinion is generally positive towards user involvement in systems development, however this acceptance is not universal. Wong and Tate (1994) cite the ETHICS (Effective Technical and Human Implementation of Computer-Based Systems) in their argument that end-user involvement is vital to successful IS development. However, they admit that the IS organisation have a low appreciation of the need for user involvement. It may also be argued that the ETHICS model also reinforces the split between the IS organisation and the rest of the business in defining the sociotechnical objectives of the system.

In their study of systems failure, Ewusi-Mensah and Przasnyski (1994) state that when end-user participation in projects is discouraged and their acquiescence is taken for granted, it may lead to future conflicts and possible abandonment. They support this by citing numerous studies which claim that end-user involvement is necessary to the successful completion of IS development projects.

Willcocks (1991) takes this idea a step further by asserting that:
“Specific IT projects are often better managed by those with business and organisational skills rather than IS professionals. Experience also suggests that mixed project teams tend to produce better long-term results” (Willcocks, 1991: 122).

Willcocks goes on to argue that traditional design methods have all too often focused upon technical considerations, with very little end-user participation “despite considerable lip service being paid to the latter.

Doherty an King (1998) endorse the need for integrated IT and user development teams, but broaden the issue to include programmes of awareness education, and training for all.

A note of caution about user involvement in IS development is put forward by Ives et al (1983, 1984). They conclude that until stronger theories are developed based upon sound method, the results of assessing the value of user involvement in IS development will remain mixed.

### 2.9 Summary - A Positive IS Culture - From Efficiency to Effectiveness.

From the literature review it can be seen that the nature of the business environment demands a cultural shift within organisations to one where the opportunities offered by information and technology as a driver of strategic advantage are appreciated by both business managers and IS specialists.

However there are significant barriers to the achievement of this culture shift. These barriers can, to a large extent, be attributed to a lack of shared meaning and commonality – a failure of business managers to understand IT and of the
IT organisation to understand business needs and priorities – and hence the inability to develop a common culture.

The process of strategic alignment can be viewed as a catalyst for creating commonality across the organisation, facilitating the creation of linkages between business and IT and aligning the focus away from efficiency at application level (and perhaps the potential for sub-optimal behaviour), towards effectiveness at an organisational level.

The development and role of CSFs is then reviewed, and is seen to be a measure of success that focuses particularly upon the reactions of individuals to the design and implementation of IS. The CSF approach fails adequately to address organisational effectiveness factors, concentrating upon technical, semantic, and user-centred factors. Even where the importance of organisational issues to IS success is recognised by writers such as DeLone & McLean (1992), the linear nature of the model they propose suggests a cause and effect relationship between the variables. This relationship in turn suggests that organisational effectiveness is somehow a culmination of or is dependent upon those factors that precede it. It will be shown later in this study that this is not the case, and that it is organisational effectiveness, *driven by a process of strategic alignment* that is the prime determinant – the dependent variable of IS success.

2.10 Establishing the Relationship between Literature and Method

The literature identifies that the path to IS success is predominantly a socio-technical phenomena; one which embraces concepts of cultural change, organisational behaviour, inter-group dynamics and communication; one that
emphasises a mainly qualitative framework of research. With this in mind, in order to explore the hypothesis and satisfy the aims and objectives an approach is taken that involves “a human attempts to explain human phenomena” (Smith, 1990). Smith (1990) identifies the case study as being a particularly useful research method for exploring social and cultural phenomena, and the justification for the chosen research method is discussed further in the following chapter. However, he cites Gluckmann (cited in Mitchell, 1983) who distinguishes between three types of case study: apt illustration, social situations, and [extended] case studies. The social situation model provides us with an illustrative example of the discussion so far, and introduces the rationale for the adoption of a case study approach. Gluckmann provides an account of the official opening of a bridge in Zululand, which brought together different sections of the population, reflecting the structure of South African society at that time (Smith, 1990). The organisation which forms the basis for this study is going through a change in the way it develops its IS. This change, whilst not meaning a wholesale shift in sub-culture relationships, does mean that there is a great deal of reflection taking place as to the “old” way of IS development in the light of the “new”. In a similar way to Gluckmann’s illustration, the IT and business sub-groups reflect the state of organisational culture (in the context of IS development) at the time. The social situation case study allows this state to be analysed “to reveal the way in which general principles of social organisation manifest themselves in some particular specified context” (Gluckmann, cited in Mitchell, 1983). The context in this case is the
relationship between strategy and IS development, and the social organisation is the organisation itself, specifically the IT and business sub-groups.
CHAPTER 3

3 METHODOLOGY

A Case Study Approach

3.1 Rationale

A case study approach was adopted in order to achieve the aims and objectives of the research. The rationale underpinning this choice is that a case study falls within the classification of ideographic research, that is “concerned with exploring particular cases or events and providing the richest picture of what transpires” (Cornford & Smithson, 1996). A case study therefore allows the development of detailed intensive knowledge, an in-depth exploration of one situation (Cornford & Smithson, 1996, Saunders et al, 1997). It was felt that the richness of data gathered using multiple means within a particular case would afford the freedom to investigate new avenues and would also act as preliminary research exercise out of which potential theories might be developed and new further research emerge. A case study is also appropriate when conducting explanatory studies (Saunders et al, 1997), where the emphasis is on studying a situation in order to explain the relationships between variables.

The rationale behind this method is an epistemological one. Cornford and Smithson (1996) argue that qualitative research contains a strong ontological dimension (explaining the nature, essential properties, and principles and
causes of being), and by adopting this approach the researcher has to accept a subjective view of reality. However, the objectives of the research cannot be realised without taking a relativist position, only by accepting that truth and value are relative to the observer and that these perspectives are by definition subjective can differences between groups be explored. Whilst it was appropriate to use a quantitative methodology to measure, in broad terms, peoples’ attitude towards a set of statements, when exploring social phenomena in depth an anti-positivist stance needed to be taken (Archer, 1988).

In coming to the decision to adopt a case study approach, other approaches were evaluated and rejected. Constructive research - developing models and frameworks that do not describe any existing reality (Cornford & Smithson, 1996) - was rejected as inappropriate, as the aims of the research were focused upon the exploration and description of existing reality. Having discarded this first approach, and moving the research away from “making it work”, towards “observing it working”, the choice of method moves away from constructive and moves towards experimental (nomothetic) or case study (ideographic).

Nomothetic research “is concerned with a search for (and evidence to support) general laws or theories that will cover a whole class of cases” (Cornford & Smithson, 1996). It attempts to achieve generality through careful attention to sampling. It was recognised that this approach would be neither appropriate nor feasible with such a project. Within the context of the case study, it would not be possible to exercise sufficient control over the variables (Saunders et al, 1997), particularly the sample. The selection of the sample
was negotiated, but ultimately under the control of the management. Changes in management and staffing led to a number of re-negotiations and false starts (Saunders et al, 1997) which would have irredeemably subverted a nomothetic/experimental approach.

It was therefore decided to adopt ideographic, case study approach. This decision, as well as being the most logical and appropriate choice was influenced by a pragmatic view of the context in which the research was set. Problems with access were apparent right from the start. As stated above, changes in staffing within the organisation meant that the research project had to be re-sold and renegotiated a number of times. Key staff were often difficult to contact and it was obvious that other pressures and priorities had impinged and would continue to impinge upon the research. An approach needed to be adopted that could, to a certain degree, bend and adapt to changing circumstances, pressures of time, and fluctuating priorities, whilst remaining focused upon the outcomes. An ideographic, case study method offered this flexibility.

3.1.1 Limitations of Case Study Approach

A case study approach is not without its problems. There may be difficulties in exercising control, in locating causality (Cornford & Smithson 1996) and in poor representativeness and replicability (Graziano & Raulin, 1997). With regard to exercising control, this is a problem that manifested itself within the case study, and will be discussed further in chapter 5. Issues such as causality, unrepresentativeness and replicability are a concern, as:
"...the very word representative implies recourse to survey research methods to demonstrate, via quantitative procedures, that the theoretical conclusions derived from the cases are applicable to the population as a whole" (Smith, 1990).

Nevertheless, Smith (1990) argues that the very nature and of social science research means that it is impossible to remove the human interpretation of social phenomena. Its sheer complexity means that the researcher cannot be too distant from the phenomena being studied, and that "for much of social science, observation and description, with possibly limited explanation, are the requisite modes". Smith (1990) cites Bonoma (1985) when arguing that in the context of social phenomena, data integrity (those characteristics of research that affect error and bias in research results) as can be achieved in laboratory experiments, is not as important as currency (which pertains to the generalisability of the results), as can be achieved in case research. He goes on to state that high data integrity methods (and consequently those with low currency):

"...cannot be efficiently applied to theory-building research: that is, research at the description end of a research continuum of description, classification, comparison, measurement/estimation, establishing association, and determining cause and effect" (Smith, 1990).

In essence, Smith argues that unrepresentativeness is irrelevant, at least temporarily irrelevant. It is irrelevant because of the exploratory, human nature of the case study, but temporary because a more quantitative, data integrative approach will be needed if theoretical conclusions are to be applied to the population as a whole. This is reflected in section 6.4. where recommendations for future research are made.
In short, the exploratory nature of a case study, together with its worth in exploring existing theory (Saunders et al, 1997) offered a firm foundation upon which the research could be set.

3.2 A Multi-Method Approach

A Multi-method approach was adopted for the collection of data. Two methods were used, each method, or phase of the research, being distinct but linked.

- **Phase I** Questionnaires

- **Phase II** Semi-Structured Interviews

There are clear advantages with employing this approach. All techniques have their strengths and weaknesses. By fusing two or more methods, the strengths can be reaped (Bryman, 1988) and the weaknesses compensated (McNeill, 1985). In this study questionnaires were utilised to identify key issues and semi-structured interviews were utilised to explore those issues in more depth to gain a more holistic understanding of the topic (Bryman, 1988).

The choice of using semi-structured interviews follows from the argument for a case study, multi-method approach. The semi-structured interviews provide the link between the quantitative and qualitative phases, the results from the questionnaire analysis providing the key themes to be covered, as well as providing the flexibility within these themes to vary the questions according to the interviewee and the organisational context (Saunders et al, 1997).

Specifically, it means that a different interview plan could be formulated for
CHAPTER 3

IT and non-IT staff (appendix 3), and that irrelevant questions could be avoided where appropriate, whilst ensuring that the key themes were covered. The choice of a semi-structured rather than a structured interview is also significant because it allowed the flexibility to vary the course of the interview to explore new ideas or issues as they arose (Cornford & Smithson, 1996), and to formulate new hypotheses and alter old ones as the research progressed (Cassell & Symon, 1994).

Flexibility is the strength of this research method, as it is this attribute that allows the exploration of complex and dynamic topics. Issues of reliability and repeatability are subsumed beneath the fact that the use of non-standardised research methods is not meant to be repeatable, as it reflects the reality at a certain point in time.

3.2.1 Phase 1 – Questionnaire phase

The first phase of the research involved collecting data by means of questionnaires sent to a sample of managers within the organisation, particularly those managers with an interest or stake in IS developments.

The questionnaire had three specific objectives:

- Objective 1 – to identify those factors\(^1\) deemed by management within the organisation to be most important to the successful implementation of an IT System (terminology determined by pilot and advice)

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\(^1\) It should be noted that the use of the word “factor” is used in its everyday sense as part of the narrative. However, the word “factor” has a specific and different meaning in a statistical context. Therefore for the sake of consistency, from this point on the word “item” will be used instead.
- Objective 2 – to determine the level of satisfaction of management with the organisation’s approach to those factors.

- Objective 3 – to identify differences in the perceived importance and satisfaction ratings between IS and business management.

3.2.1.1 The Sample

The method by which the sample was determined was by and large a pragmatic decision dictated by circumstance and resources. The size and dispersion of the sample frame precluded a large-scale survey and subsequent interviews at locations throughout the UK and USA (the organisation employs 8300 people in its operation in the UK and the United States). It was therefore decided to concentrate upon senior, line, and middle managers based in locations in and around London, and to identify those managers with a particular interest or stake in the development of IT systems – IT decision-makers (London was chosen due to the concentration of staff at centres at Heathrow, Gatwick, and the corporate office in the city). The method used may therefore be described as non-probability, purposive sampling (Saunders et al, 1997). The sample was chosen under the guidance of senior staff within the organisation who were able to make judgements about the suitability of individuals for study. The resulting sample was heterogeneous in terms of their experience of IT, involvement in IT projects, and background, whilst homogeneous in terms of their management status within the company and their common interest in the future of IT within the organisation. The composition of this sample ensured a variety of perspectives upon IT developments, but these perspectives were set within
specific boundaries, in accordance with the aims and objectives of this phase of the research.

The means by which the sample was selected does limit the reliability of subsequent statistical analysis (Saunders et al, 1997), the sample not being seen as representative of the whole population. However, as indicated above, expediency did not stop the selection of a sample that was indicative of the target population. If the research had been sponsored by the organisation, with the balance between goodwill and authority being more on the side of authority, access problems could have been reduced and a more reliable sampling method used.

The sample consisted of 82 subjects (this would eventually be reduced to 60, as without explanation the organisation withdrew permission to contact a particular sub-group).

60 Questionnaires were issued and 31 were returned. There were no spoiled or incomplete questionnaires. The response rate was 52% (Figure 6).

![Questionnaire Response Diagram]

**Figure 6 - Questionnaire response rate**
3.2.1.2 Design of the Survey Instrument

The design of the survey was based upon work carried out by Bailey & Pearson (1983) and enhanced by Li (1997), who established an organisational context for the analysis. The instrument resulting from these studies would provide a reliable method for collecting data as well as enabling limited comparison of results with research already conducted (Cornford & Smithson, 1996). The instrument consisted of 46 items within 8 dimensions (appendix 1 – original list of items and dimensions). The instrument was however limited to determining the relative importance to the individual of the items. For the purposes of this study, it was expanded to include satisfaction ratings. This would enable subsequent analysis to determine if any correlation of each item existed between importance and satisfaction from an individual perspective.

Two new items were added – Access to learning and training resources and Provision of knowledge resources for decision support – under the dimensions of Individual Impact and Information Use respectively. These questions were added in order to facilitate subsequent research. One item was removed – Chargeback method of payment for services as this was irrelevant in this particular context. The resulting 47 items and their dimensions are shown in appendix 1.

Each survey subject would be asked to evaluate each item in terms of importance and satisfaction, using a 7-point Likert-type scale ranging from -3 to +3. For importance, the scale would read from ‘not at all important’ to ‘very important’, for satisfaction the scale would read ‘very dissatisfied’ to
‘very satisfied’. The items were placed randomly within the questionnaire and were not set within their corresponding dimensions. It was expected that this would reduce bias by disassociating the items from the general dimension headings.

3.2.1.3 The Pilot

Whilst the items had been drawn from prior research, it would still be necessary to ensure that they fulfilled the following criteria (Cornford & Smithson, 1996, Graziano & Raulin, 1997).

- Clear and unambiguous.
- Do not make any unnecessary assumptions.
- Free of jargon.
- Comprehensive.
- Answerable without the respondent having to seek out information themselves.
- That they measured the underlying dimension.

It was clear from the outset that some of the items used language and were worded in such a way that it was impossible to meet these criteria. A number of colleagues (both IT and non-IT) were asked to read the items and indicate in broad terms their level and nature of understanding. It was interesting to note that in many cases there was a fundamental difference in understanding between the reader and the author (Bailey & Pearson, 1983, Li, 1997). The reasons for this difference are not addressed in this thesis, suffice to say that it.
caused a rewording of a number of items based upon Bailey & Pearson’s original definitions.

The resulting questionnaire was then piloted to six volunteers within the organisation. The pilot was undertaken for three main reasons:

- The questionnaire could be refined based upon the comments of the respondents.
- It would allow the data coding procedures to be tested.
- It would be possible to make sure the questionnaire did not take too long to complete – a major barrier to response (Cornford & Smithson, 1996, Saunders et al, 1997).

As well as piloting the questionnaire, the covering letter was also piloted to ensure that the instructions were clear and that respondents felt motivated and secure in their anonymity.

3.2.1.4 Result of the Pilot

It was apparent that those completing the questionnaire were still having problems understanding the meaning of some items. As a result, a number of items were reworded in order to improve clarity and understanding. These changes can be seen by comparing the original items detailed in appendix 1 with the final version in appendix 2.

Four respondents also requested that the items be sorted and grouped under relevant headings to assist in clarification and understanding. These requests were made independently and with no knowledge of the existence of the dimensions. It was felt that whilst there might be something to be gained
from the absence of order and subdivision of the items in terms of bias as discussed earlier, it was more important to ensure that those completing the questionnaire understood the meaning of the items as thoroughly as possible. The items were therefore sorted and placed within their appropriate dimension headings.

Two other changes were made in accordance with requests from the organisation. Firstly, the font used in the covering letter was changed to *Times New Roman*, the company standard font, and secondly, all references to *User* were changed to *Customers*, the preferred term within the organisation.

### 3.2.1.5 The Questionnaire

It was decided that the best way to administer the questionnaire procedure was to promote it as a joint research project between the organisation and UWIC, and for a member of staff based at Gatwick to be responsible for distributing and collecting the questionnaires using the internal mail system. Adopting this approach would give rise to a number of benefits:

- The survey would be attributed weight and authority.
- The logistics could be controlled from within the organisations’ structures.
- Costs could be controlled and kept to a minimum.
- Most importantly, items 1 and 2 would help to ensure that the survey achieved a high response rate, legitimacy being provided by the organisation, and attributes of both *postal* and *delivery and collection* questionnaires being realised (Saunders et al, 1997).
The survey took place in April and May 1998. Firstly, a senior member of staff within the Human Resources section contacted those in the sample via e-mail. The contact was made independently by the organisation in order to forewarn those invited to participate and to place the survey in an organisational context. Two weeks later, the questionnaires were distributed with an accompanying letter (typed on headed paper), building upon the previous e-mail and laying the ground rules for the survey and its completion (a copy of the letter can be seen in appendix 2). Each questionnaire was allocated a unique number, this number being linked to the name and location of the participant.

Participants were then given two weeks to complete the questionnaire. At the end of the two weeks, an e-mail was sent as a reminder to all those who had not yet responded. Four weeks after the despatch of the questionnaires, completed forms were returned to UWIC for analysis.

3.2.1.6 Data Analysis

The data were checked and coded. A simple coding frame was used, with each of the 7 Likert-type scale points -3 to +3 being allocated the numeric code 1 – 7 respectively. The data were then input into SPSS (Statistics Package for the Social Sciences) Version 8.0 for analysis.

The first test to be applied to the data was that of reliability. Using Cronbach’s reliability analysis, it was possible to determine the extent to which the items in the questionnaire were related to each other, and to get an overall index of the repeatability or internal consistency of the scale as a whole. Moreover, it would facilitate the identification of problem items that
should be excluded from the scale, or at best treated with a degree of caution. The nature of ordinal data means that a number of statistical tests cannot meaningfully be used (Graziano & Raulin, 1997). By establishing reliability and undertaking much of the subsequent analysis at dimension level, this problem was overcome.

Secondly, the data was described in terms of its central tendency, dispersion, and where appropriate, distribution. It should be noted that when statistically describing individual items the central tendency was measured using the median, whilst the mean was used for analysis of the dimensions. The median has the advantage that it is not affected by extreme values in the distribution. The mean however, is unduly influence by extreme data values, which is why the description of central tendency also included the standard deviation and skew (Saunders et al, 1997). From this it was possible to describe the dispersion of values around the mean.

The final part of the descriptive analysis was to rank the data in terms of importance and satisfaction. This was done at dimension level.

Correlation was used to examine the closeness of relationship between the variables both at item and at dimension level (Hannagan, 1988). Spearman’s Rank Correlation Coefficient was used to examine the ordinal data at item level, Pearson’s Product Moment Correlation Coefficient was used to examine the relationship at dimension level (Saunders et al, 1997). The tests were carried out both vertically and horizontally across the data in order to identify any relationship within each question and between each question.
Finally, an independent t-test was undertaken to determine differences between the responses of IT and non-IT staff (Saunders et al, 1997) for both importance and satisfaction. This test is sufficiently robust to use on data that does not have a normal distribution and for a small sample size. It is appreciated that the size of the sample of IT managers was very small (n=5), care was taken to ensure that those respondents was based at different locations and working on different projects and were unlikely to confer whilst completing their questionnaires.

3.2.2 Phase 2 – Semi-Structured Interviews

The second phase of the research was to collect data by means of semi-structured interviews in order to more fully explore issues arising from the analysis of the questionnaire and help to understand the reasons for the research participants’ attitude and opinion (Saunders et al, 1997).

Specifically this phase of the research had two objectives:

- To more fully understand the attitudes and opinions underpinning the issues raised from phase 1 of the research.

- To identify and investigate differences in attitude and opinion raised from phase 1 of the research between IS developers and IS customers (users).

3.2.2.1 The Sample

It was negotiated with the organisation that 15 people who responded to the questionnaire could be interviewed. Once again, a purposive, pragmatic approach was taken to selecting the sample. Individuals were selected who were in the best position to reflect upon issues emerging from the
questionnaire data analysis. For example, individuals were invited for interview that had a strategic role or an involvement in strategy formulation, and/or who had expressed strong opinion about issues for further exploration. Those being invited would also have gone through the selection process for phase I, so could already be described as being managers and stakeholders in IS developments within the organisation. To achieve the stated outcomes it was also necessary to interview both IS providers and IS customers. Three members of IT Services who responded to the questionnaire were therefore invited for interview.

The final sample consisted of:

Three members of IT Services – the provider – managing different projects, including legacy systems, process re-engineering, Year 2000 compliance, and involved in maintenance and development.

Nine members of functional management – the customers – ranging in rank from middle management to Director, and being both functionally and geographically spread (within the limits of the sample method).

3.2.2.2 Designing the Interview Plans

The issue of data quality and reliability is of great concern when designing and conducting interviews. Issues of reliability, bias, and generisability all have to be considered (Saunders et al, 1997). The issue of reliability has been discussed above, weaknesses in the qualitative method effectively being turned into strengths in terms of the richness of data able to be collected in pursuit of the outcomes of the research. Saunders et al state that bias takes two forms: interviewee or response bias, and interviewer bias. Interviewee
bias may be caused by the interviewees’ perception about the interviewer, or may be in response to perceived interviewer bias about the topic under investigation. The design of the interview schedule was careful to phrase questions neutrally, whilst at times it was necessary to put statements to interviewees that were controversial, being designed to probe perceptions and illicit a thoughtful response. The author, who has many years’ experience in the IT industry, conducted the interviews. This helped establish the interviewer credibility, but at the same time it was appreciated that years of being immersed in the topic area would be both help and a hindrance in establishing the quality and reliability of the data. Actual experience of many of the issues would be invaluable in exploring the issues and probing for information, but it would also have coloured the interviewers’ opinions and perceptions, potentially leading to bias, albeit unconscious, when varying from the standard question path. The interviewer was therefore careful to keep responses as neutral as possible, but still show sufficient interest in the interviewees’ response to elicit further information.

The issues to be covered by the interviews emerged from analysis of the phase I questionnaire responses and were, in summary:

- The existence and role of strategy, both business and IT.
- The role of the user in systems development.
- Systems use, particularly in terms of its relationship to quality.
- Customers attitude towards IT and how this attitude affects their knowledge and awareness of IT.
- Perceived ownership of, control over IT systems development.
CHAPTER 3

- The relationship between IT providers and their customers.
- The performance of systems in the light of perceptions about the nature of the operating environment.
- The relative importance of strategic and non-strategic items in assessing systems success.
- The IT providers knowledge of business issues and how this affects the provision of IT services and the relationship with their customers.
- The quality of documentation.
- Training in relation to operating the systems, understanding the outputs, and in adjusting to the job effects of introducing new technology.

Two interview schedules were developed, one for IT providers and one for IT customers. Each interview emphasised and varied questions in order to explore group differences and understand the relationship between the provider and their customers (a copy of each interview schedule may be seen in appendix 3).

3.2.2.3 Procedure

Interviews were organised and appointments made by a member of staff from the organisation, saving a great deal of time and effort on the part of the researcher and were conducted in July 1998, at offices in and around London. Twelve interviews took place, three appointments being cancelled at the last minute due to other priorities.

Interviews were conducted, for the most part, at the workplace of the interviewee, in a room booked for the purpose, and without interruption.
Each interview was scheduled to take between 45 minutes and 1 hour and, with the permission of the interviewee, was taped to facilitate subsequent transcription.

3.2.2.4 Qualitative Data Analysis

A paradox exists between the rationale behind the choice of collecting qualitative data and the method chosen for analysis. As argued above, collection of qualitative data means taking an anti-positivist stance, however, content analysis sits firmly within the logical-positivist tradition (King, 1994). King argues that structured open response interviews (semi-structured interviews) share assumptions between both positivist and more humanistic approaches. This means that the data are not structured enough for detailed statistical analysis, and not responsive enough to extract anything more than surface meanings. However, the use of a quasi-statistical approach such as content analysis allows key themes to be identified (King, 1994), within a framework of objectivity, systemisation, and quantification—"A measurement of the extent of emphasis or omission of any given analytic category is what content analysis is all about" (Kassarjian, 1977). The use of content analysis facilitates the transformation or disaggregation of the textual data into quantitative data in order to identify key themes or patterns from it for further exploration (Saunders et al, 1997). A process that fits very well with the aims and objectives of the research.

The interviews were listened to, transcribed and read. Repeating patterns of response were identified, counted, and interpreted, and from this issues for
further analysis were identified. These issues were categorised or grouped into to key themes and then into sub-themes within the key themes (figure 7).

Once common patterns and themes started to emerge, a conceptual model was built that represented the relationship and structure of the themes and ideas resulting from the analysis. This conceptual model was modified and refined as the analysis progressed (Cornford & Smithson, 1996), the final version being used as a framework for subsequent discussion.

### 3.3 Summary

Smith (1990) cites McClintock et al. (1979) who refer to case studies as *strategies* rather than *methods*. This semantics of strategy rather that method seem appropriate to this research, as the case study employs a number of approaches to obtaining data, the end result being the achievement of its aims and objectives, and theoretical conclusions drawn about the hypothesis. More specifically, the case study has been shown to provide the most appropriate epistemological foundation by which the aims and objectives may be explored. The objectives of the research are predominantly qualitative, including issues such as culture, relationships and perception in a mainly social context. As discussed above, the case study fits this social science context because it allows the freedom to apply human interpretation to complex human situations; to explore freely without the rigid constraint imposed to ensure data integrity. However, this strategy has been chosen with a clear appreciation of its limitations and in the knowledge that whilst it may provide a rich, current picture of the research question at one moment in
time, further work will be required to investigate the representativeness of any conclusions.

Figure 7 - Key Themes, Sub Themes and Issues
4 **RESULTS**

In this chapter the results of the questionnaire and interview data collection phases of the research will be presented. Firstly, the reliability of the quantitative instrument will be assessed and a new dimension of *Strategic Issues* proposed. Descriptive statistics at both item and dimension level will then be presented, followed by a correlation analysis and independent groups t-test. Lastly, the results of the content analysis of the semi-structured interviews will be presented, identifying key themes, sub-themes and issues for subsequent discussion in chapter 5.

4.1 **RESULTS OF INFORMATION SYSTEMS QUESTIONNAIRE**

The Quantitative Study

4.1.1 Responses

The questionnaire is shown as Appendix Item 1.

The data from the questionnaire was coded and analysed as described in Chapter 3. Table 1 is for information and relates the each item to a item number. This has been done to reduce the size of subsequent tables.
## DIMENSION | ITEM | DESCRIPTION
--- | --- | ---
**System Quality**
1 | The means by which the customer inputs data and receives output | The language used to interact with the systems
2 | Accuracy of Output | The congruence between the customers' requirements and the resulting system
3 | The language used to interact with the systems | The policies and methods governing correction of system errors
4 | The congruence between the customers' requirements and the resulting system | Security of the system
5 | The policies and methods governing correction of system errors | Documentation of systems and procedures
6 | Security of the system | Ability of the systems to adapt to new demands or conditions
7 | Documentation of systems and procedures | Ability of the systems to share common data and procedures
**Information Quality**
10 | Accuracy of output | Accuracy of output
11 | Timeliness of output | Timeliness of output
12 | Level of detail | Level of detail
13 | Reliability of output | Reliability of output
14 | Output up-to-date | Output up-to-date
15 | Completeness of output | Completeness of output
16 | Format of output | Format of output
17 | Clarity of output | Clarity of output
18 | Completeness of output | Completeness of output
**Information Use**
19 | Quantity of output | Quantity of output
20 | Ability of the output to support decision-making | Ability of the output to support decision-making
21 | Access to internal and external training resources | Access to internal and external training resources
**Client Satisfaction**
22 | Top management involvement | Top management involvement
23 | Customers' confidence in the system | Customers' confidence in the system
24 | Customers' participation in IT systems development | Customers' participation in IT systems development
25 | Ability of the systems to adapt to customers' preferences and ways of working | Ability of the systems to adapt to customers' preferences and ways of working
26 | The quality and quality of available computer hardware and software | The quality and quality of available computer hardware and software
**Importance to the Individual**
27 | The features and attributes of the IT in support of the customers' role or function | The features and attributes of the IT in support of the customers' role or function
28 | Improvements in job performance | Improvements in job performance
29 | Perceived utility | Perceived utility
### Service Quality

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>30</td>
<td>Technical competence of the IT personnel</td>
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<tr>
<td>31</td>
<td>Attitude of the IT personnel</td>
</tr>
<tr>
<td>32</td>
<td>The timetable for provision of IT services</td>
</tr>
<tr>
<td>33</td>
<td>Time elapsed between requests for and provision of IT services</td>
</tr>
<tr>
<td>34</td>
<td>Processing of requests for system changes</td>
</tr>
<tr>
<td>35</td>
<td>Type and quality of hardware/software support from the supplier</td>
</tr>
<tr>
<td>36</td>
<td>The means by which the customer inputs data and receives output</td>
</tr>
<tr>
<td>37</td>
<td>Customers' understanding of the system</td>
</tr>
<tr>
<td>38</td>
<td>IT systems training provided to customers</td>
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</table>

### Conflict Resolution

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>39</td>
<td>Conflict between IT users and non-IT users for organisational resources</td>
</tr>
<tr>
<td>40</td>
<td>Priorities in allocating IT resources</td>
</tr>
<tr>
<td>41</td>
<td>Relationship between customers and IT personnel</td>
</tr>
<tr>
<td>42</td>
<td>Perceived control over / ownership of the IT systems</td>
</tr>
<tr>
<td>43</td>
<td>Position of Group IT within organisational hierarchy</td>
</tr>
<tr>
<td>44</td>
<td>Customers' attitude toward using the IT systems</td>
</tr>
</tbody>
</table>

### Organisational Impact

<table>
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<tr>
<td>45</td>
<td>Productivity Improved by IT systems</td>
</tr>
<tr>
<td>46</td>
<td>Ability of the systems to provide the greatest return on investment</td>
</tr>
<tr>
<td>47</td>
<td>Effectiveness of the IT systems in their capacity to help solve problems</td>
</tr>
</tbody>
</table>

Table 1 - Relating Variable Number to Item Description within Dimension

#### 4.1.2 Reliability Analysis

Table 2 shows the results of a reliability analysis for responses at dimension level. Those dimensions with a reliability coefficient $\alpha > 0.7$ may be considered reliable for further analysis. Those with a reliability coefficient $\alpha < 0.6$ may not.

In terms of importance (Q1), All dimensions may be considered to be reliable, with the exception of:
CHAPTER 4

- Information Use.
- Client Satisfaction.
- Importance to the individual.

System Quality and Organisational Impact, whilst not achieving a rating of 0.7, may be considered to be approaching reliability, with ratings of 0.6873 and 0.6885 respectively.

Responses for Satisfaction (Q2) are in general more reliable. All dimensions achieve a rating > 0.7 with the exception of Information Use and Client Satisfaction, which may be considered to be approaching reliability, with ratings of 0.6018 and 0.6950 respectively.

<table>
<thead>
<tr>
<th>DIMENSION</th>
<th>ITEMS</th>
<th>ITEMS N</th>
<th>CASES N</th>
<th>IMP α</th>
<th>SAT α</th>
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</thead>
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<tr>
<td>System Quality</td>
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<td>31</td>
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<td>0.7741</td>
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<td>31</td>
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<td>Information Use</td>
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<td>31</td>
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<td>0.6018</td>
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<td>5</td>
<td>31</td>
<td>0.2815</td>
<td>0.6950</td>
</tr>
<tr>
<td>Importance to The Individual</td>
<td>27-29</td>
<td>3</td>
<td>31</td>
<td>0.5657</td>
<td>0.7068</td>
</tr>
<tr>
<td>Service Quality</td>
<td>30-38</td>
<td>9</td>
<td>31</td>
<td>0.7345</td>
<td>0.8782</td>
</tr>
<tr>
<td>Conflict Resolution</td>
<td>39-44</td>
<td>6</td>
<td>31</td>
<td>0.7280</td>
<td>0.8399</td>
</tr>
<tr>
<td>Organisational Impact</td>
<td>45-47</td>
<td>3</td>
<td>31</td>
<td>0.6885</td>
<td>0.8963</td>
</tr>
<tr>
<td>All Items</td>
<td>1-47</td>
<td>47</td>
<td>31</td>
<td>0.9244</td>
<td>0.9656</td>
</tr>
</tbody>
</table>

Table 2 - Reliability Analysis
4.1.3 Correlation of Items within those Dimensions considered to be unreliable

Within each dimension that failed the reliability test, one item greatly influenced the result (item 20 – Ability of the output to support decision-making, item 25 – Ability of the systems to adapt to customers’ preferences and ways of working, item 29 – Perceived utility). If this item were to be deleted from the dimensional analysis, the reliability would be greatly improved (Table 3).

<table>
<thead>
<tr>
<th>DIMENSION</th>
<th>ITEM</th>
<th>Q1 α</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information Use</td>
<td>19</td>
<td>0.3319</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>0.6308</td>
</tr>
<tr>
<td></td>
<td>21</td>
<td>0.1346</td>
</tr>
<tr>
<td>Client Satisfaction</td>
<td>22</td>
<td>0.2193</td>
</tr>
<tr>
<td></td>
<td>23</td>
<td>0.1915</td>
</tr>
<tr>
<td></td>
<td>24</td>
<td>0.1014</td>
</tr>
<tr>
<td></td>
<td>25</td>
<td>0.5565</td>
</tr>
<tr>
<td></td>
<td>26</td>
<td>0.1296</td>
</tr>
<tr>
<td>Importance to the Individual</td>
<td>27</td>
<td>0.3956</td>
</tr>
<tr>
<td></td>
<td>28</td>
<td>0.3338</td>
</tr>
<tr>
<td></td>
<td>29</td>
<td>0.6442</td>
</tr>
</tbody>
</table>

Table 3 - Effect of Unreliable Items

In order to evaluate the appropriateness of these 3 items, Pearson’s coefficient of correlation was used to show the closeness of the relationship between the items within those dimensions shown to be unreliable.

From tables 4 and 5 it can be seen that there is a significant correlation between the importance of items 19 (Quantity of output) and 21 (Access to
internal and external training resources). Item 20 (Ability of the output to support decision-making) does not significantly correlate with any other item within the dimension. The lack of any significant correlation between item 20 and the others may reflect the more qualitative nature of the item, or the respondent's perception that this particular dimension lacks cohesion and/or a logical basis. This is explored further in section 4.1.4. and discussed in chapter 5 section 5.2.1 (as is the following analysis).

<table>
<thead>
<tr>
<th>INFORMATION USE</th>
<th>ITEM 19</th>
<th>ITEM 20</th>
<th>ITEM 21</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item 19</td>
<td>1.000</td>
<td>-0.010</td>
<td>-0.478</td>
</tr>
<tr>
<td>Item 20</td>
<td>-0.010</td>
<td>1.000</td>
<td>0.126</td>
</tr>
<tr>
<td>Item 21</td>
<td>0.478</td>
<td>0.126</td>
<td>1.000</td>
</tr>
</tbody>
</table>

Table 4 - Correlation Matrix of Items within Information Use Dimension

*Significance at .01 level

<table>
<thead>
<tr>
<th>ITEM</th>
<th>COEFF</th>
<th>STRENGTH</th>
<th>%/</th>
<th>SIG</th>
<th>HIGH/LOW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantity of Output</td>
<td>0.478</td>
<td>Moderate</td>
<td>+</td>
<td>.006</td>
<td>Fairly high</td>
</tr>
</tbody>
</table>

Table 5 - Items from Table 4 with a correlation coefficient > ± 0.4

Tables 6 and 7 show that within the Client Satisfaction dimension, the only significant correlation of importance is between items 22 (Top management involvement) and 24 (Customer's participation in IT systems development).
CHAPTER 4

Item 25 (Ability of the systems to adapt to customers’ preferences and ways of working) can be disregarded from the analysis, as this item was added to the standard instrument to explore an area no longer relevant to this research. The relationship between items 22 and 24 are clear, as they are both to do with involvement in the systems development process.

<table>
<thead>
<tr>
<th>CLIENT SATISFACTION</th>
<th>ITEM 22</th>
<th>ITEM 23</th>
<th>ITEM 24</th>
<th>ITEM 25</th>
<th>ITEM 26</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item 22</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Item 23</td>
<td>.105</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Item 24</td>
<td>.476*</td>
<td>.296</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Item 25</td>
<td>-.228</td>
<td>.156</td>
<td>-.031</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>Item 26</td>
<td>.207</td>
<td>.129</td>
<td>.207</td>
<td>-.125</td>
<td>1.000</td>
</tr>
</tbody>
</table>

Table 6 - Correlation Matrix of Items within Client Satisfaction Dimension

*Significance at .01 level

<table>
<thead>
<tr>
<th>ITEM</th>
<th>COEFF</th>
<th>STRENGTH</th>
<th>*/</th>
<th>SIG</th>
<th>HIGH/LOW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top management involvement</td>
<td>.476</td>
<td>Moderate</td>
<td>+</td>
<td>.007</td>
<td>Fairly high</td>
</tr>
<tr>
<td>Customers participation in IT Development</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 7 - Items from Table 6 with a correlation coefficient > ± 0.4

From tables 8 and 9 it can be seen that there is a significant correlation between the importance of items 27 (The features and attributes of the IT in...
support of the customers’ role or function) and 28 (Improvements in job performance). Item 29 (Perceived utility) does not significantly correlate with any other item within the dimension. The attribution of some items within dimensions seems to lack consistency and perhaps sufficient grounding in theory. In the context of management theory, Drucker (cited in Lucey, 1997) identifies decision-making as one of the key functions of management. This instrument places the ability to support decision-making in a separate dimension from the attributes of IT to support the customer’s role or function. This sort of inconsistency may well contribute to much of the unreliability.

### Table 8 - Correlation Matrix of Items within Importance to the Individual Dimension

*Significance at .01 level*

<table>
<thead>
<tr>
<th>IMPORTANCE TO THE INDIVIDUAL</th>
<th>ITEM 27</th>
<th>ITEM 28</th>
<th>ITEM 29</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item 27</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Item 28</td>
<td>.431*</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>Item 29</td>
<td>.255</td>
<td>.215</td>
<td>1.000</td>
</tr>
</tbody>
</table>

### Table 9 - Items from Table 8 with a correlation coefficient > ± 0.4

<table>
<thead>
<tr>
<th>ITEM</th>
<th>COEFF</th>
<th>STRENGTH</th>
<th>*/+</th>
<th>SIG</th>
<th>HIGH/LOW</th>
</tr>
</thead>
<tbody>
<tr>
<td>The features or attributes of the IT in support of the customers role or function</td>
<td>.431</td>
<td>Moderate</td>
<td>+</td>
<td>.007</td>
<td>Fairly high</td>
</tr>
<tr>
<td>Improvements in job performance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4.1.4 The STRATEGIC ISSUES Dimension

It was decided to select a number of items that would allow exploration of the data more in terms specifically related to strategy development and application. 13 items were identified as being of strategic interest, the rationale for their selection being discussed in section 5.2.1. These items are shown in table 13, and form what will now be called the Strategic Issues Dimension.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>04</td>
<td>The congruence between the customers’ requirements and the resulting system</td>
</tr>
<tr>
<td>08</td>
<td>Ability of the systems to adapt to new demands or conditions</td>
</tr>
<tr>
<td>09</td>
<td>Ability of the systems to share common data and procedures</td>
</tr>
<tr>
<td>20</td>
<td>Ability of the output to support decision-making</td>
</tr>
<tr>
<td>22</td>
<td>Top management involvement</td>
</tr>
<tr>
<td>24</td>
<td>Customers’ participation in IT systems development</td>
</tr>
<tr>
<td>29</td>
<td>Perceived utility (worth vs. cost)</td>
</tr>
<tr>
<td>32</td>
<td>The timetable for provision of IT services</td>
</tr>
<tr>
<td>40</td>
<td>Priorities in allocating IT resources</td>
</tr>
<tr>
<td>42</td>
<td>Perceived control over / ownership of the IT systems</td>
</tr>
<tr>
<td>45</td>
<td>Productivity improved by IT systems</td>
</tr>
<tr>
<td>46</td>
<td>Ability of the IT systems to provide the greatest return on investment</td>
</tr>
<tr>
<td>47</td>
<td>Effectiveness of the IT systems in their capacity to help solve problems</td>
</tr>
</tbody>
</table>

Table 10 - Items selected for inclusion in the Strategic Issues dimension
Reliability

Items 20 and 29 are included in this new dimension. Having had a detrimental impact upon the reliability of the Information Use and Importance to the Individual dimensions respectively, the reliability of the new Strategic Issues dimension is high, both for Importance and for Satisfaction.

<table>
<thead>
<tr>
<th>DIMENSION</th>
<th>ITEMS</th>
<th>ITEMS N</th>
<th>CASES N</th>
<th>Q1</th>
<th>Q2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic Issues</td>
<td>4, 8, 9, 20, 22, 24, 29, 32, 40, 42, 45, 46, 47</td>
<td>13</td>
<td>31</td>
<td>0.7740</td>
<td>0.8972</td>
</tr>
</tbody>
</table>

Table 11 - Reliability Analysis of Strategic Issues Dimension
4.1.5 Descriptive Statistics at Item Level

**Items** (Table 12)

Each question for each item received 31 responses (n=31). There were no missing responses.

**Central Tendency**

For Importance, all items were ranked high, the lowest median response being 5, and the most common being 6. Of the 47, 2 items had a median response of 5, 31 of 6, and 14 of 7. For Satisfaction, the central tendency occupies the middle ground, median values ranging between 3 and 5. Of the 47, 2 items had a median response of 3, 34 of 4, and 11 of 5.

**Dispersion**

The Inter-Quartile (IQ) range for Importance ranges between 1 and 6, with the mean being 3.48. This indicates a reasonably high consistency in response, the dispersion, being quite low. For Satisfaction, the IQ range is between 4 and 6 (mean 5.31), indicating a consistently wide dispersion of responses.

The conclusion may be drawn that there was a higher degree of agreement as to the level of importance of individual items in comparison to the level of satisfaction being experienced.
<table>
<thead>
<tr>
<th>Item</th>
<th>Median</th>
<th>IQ Range</th>
<th>Item</th>
<th>Median</th>
<th>IQ Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>02</td>
<td>7</td>
<td>2</td>
<td>02</td>
<td>5</td>
<td>6</td>
</tr>
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<td>38</td>
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<td>4</td>
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<td>4</td>
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</tr>
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<td>2</td>
<td>05</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
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</tr>
<tr>
<td>06</td>
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<td>5</td>
<td>14</td>
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</tr>
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<tr>
<td>39</td>
<td>5</td>
<td>6</td>
<td>09</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

Table 12 - Descriptive Statistics - Individual Items – sorted in descending order by median for both Importance and Satisfaction
4.1.6 Descriptive Statistics at item level (non-IT responses only)

**Items** (Table 13)

Each question for each item received 26 responses (n= 26). There were no missing responses.

**Central Tendency**

For Importance, the mean median response was high (6.27), the lowest response being 6. For Satisfaction, the central tendency occupies the middle ground, median values ranging between 3.5 and 6, the mean being 4.25. Non-IT respondents therefore considered all items to be important, but were neither pleased nor displeased with the organisation's approach to these items.

**Dispersion**

The median Inter-Quartile (IQ) range for Importance ranges between 3 and 7, with the mean being 4.33. This indicates a moderately wide dispersion of responses, the dispersion, being quite high. For Satisfaction, the IQ range is between 5 and 7 (mean 6.15), indicating a consistently wide dispersion of responses.

The conclusion may be drawn that there was a higher degree of agreement as to the level of importance of individual items in comparison to the level of satisfaction being experienced, although non-IT respondents generally considered items to be more important than the respondents as a whole, and they were generally more satisfied with the organisation's approach.
<table>
<thead>
<tr>
<th>N</th>
<th>Item</th>
<th>Importance Median</th>
<th>Importance Range</th>
<th>Satisfaction Item</th>
<th>Satisfaction Median</th>
<th>Satisfaction Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>26</td>
<td>02</td>
<td>7</td>
<td>3</td>
<td>06</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
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<td>06</td>
<td>7</td>
<td>6</td>
<td>02</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>26</td>
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<td>7</td>
<td>3</td>
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<td>5</td>
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</tr>
<tr>
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<td>13</td>
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</tr>
<tr>
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Table 13 - Descriptive Statistics - Individual Items – Non-IT only - sorted in descending order by median for both Importance and Satisfaction
4.1.7 Descriptive Statistics at item level (IT responses only)

Items (Table 14)

Each question for each item received 5 responses (n = 5). There were no missing responses.

Central Tendency

For Importance, the mean median response was high (6.27), the lowest response being 5. For Satisfaction, the central tendency occupies the middle ground, median values ranging between 2 and 6, the mean being 3.55. IT respondents therefore considered all items to be important, but were generally less satisfied than the non-IT respondents with the organisation’s approach to these items.

Dispersion

The median Inter-Quartile (IQ) range for Importance ranges between 2 and 7, with the mean being 2.72. This indicates a high consistency of response, the dispersion, being low. For Satisfaction, the IQ range is between 5 and 6 (mean 3.72), indicating a moderately high consistency of response.

The conclusion may be drawn that the IT respondents were reasonably consistent in their assessment of both importance and satisfaction and were generally less satisfied with the organisation’s approach to the items under consideration than the non-IT respondents.
### Table 14 - Descriptive Statistics - Individual Items - IT only - sorted in descending order by median for both Importance and Satisfaction

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4.1.8 Descriptive Statistics at Dimension Level

(Tables 15 and 16)

Decreasing the granularity of the data by grouping responses within dimensions allows for more reliable and meaningful analysis. The Strategic Issues dimension has been included in this analysis.

Central Tendency

The mean responses for Importance ascribe a high level of importance to each dimension, Information Quality and Organisational Impact having the highest ratings (figure 8).

The mean responses for Organisational Impact show this dimension achieving the lowest satisfaction rating (3.8172), closely followed by Strategic Issues (3.8635) (figure 9). In general, the mean responses show that respondents exhibit no strong feeling of either satisfaction or dissatisfaction about the organisation’s approach.

Dispersion

The standard deviation from the mean shows a narrow spread of responses for Importance across all dimensions, Strategic Issues having the widest spread (5.8871). Responses for Satisfaction have in general a higher value for standard deviation and therefore a wider spread of responses for each dimension. This is particularly the case for the dimensions Information Quality and Strategic Issues.
### Table 15 - Descriptive Statistics – Dimensions – Importance - Ranked by Mean

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### Table 16 - Descriptive Statistics – Dimensions – Satisfaction - Ranked by Mean

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Page 81
Further analysis of the data contained in tables 15 and 16 highlighted a very significant strong positive correlation between the coefficients of variation for importance and satisfaction. This correlation is presented in figure 10 and would indicate that as the level of agreement increases as to what is important to IS success, so the level of agreement increases as to how satisfied the population is to the organisation’s approach. This finding and its implications are discussed further in chapter 5 section 5.3.2.

4.1.9 Correlation Analysis

Applying significance at .01 level, there is very low correlation found at dimension level (table 17). This may reflect the lack of a common, consistent understanding of the dimensions and the items contained therein. It may also add weight to the notion that the fundamental construction and application of the instrument is suspect.

In order to place the analysis firmly in the context of the research topic, and to capitalise upon its reliability, a more extensive correlation analysis was undertaken specifically on the Strategic Issues dimension. This would enable any relationships that may exist between Importance and Satisfaction to be explored, particularly with the view of identifying any differences between the IT and non-IT responses. Whilst it was recognised that testing at item level within the Strategic Issues dimension would to some extent work against the overall reliability of the dimension, any differences found were considered to add to the overall analysis.
CHAPTER 4
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<tr>
<th>Issues</th>
<th>Strategic</th>
<th>Quality System</th>
<th>Quality Service</th>
<th>Org Impact</th>
<th>Information Use</th>
<th>Information Quality</th>
<th>Importance to Individual</th>
<th>Resolution Conflict</th>
<th>Satisfaction Client</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coef</td>
<td>0.078</td>
<td>0.096</td>
<td>0.274</td>
<td>0.083</td>
<td>0.034</td>
<td>0.177</td>
<td>0.111</td>
<td>0.027</td>
<td></td>
</tr>
<tr>
<td>Coef</td>
<td>1.00</td>
<td>1.00</td>
<td>0.83</td>
<td>0.34</td>
<td>0.45</td>
<td>0.74</td>
<td>0.71</td>
<td>0.41</td>
<td>0.042</td>
</tr>
<tr>
<td>Coef</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
</tr>
</tbody>
</table>

*Significance at .01 level

Table 17 - Correlation Matrix of Dimensions - Importance vs Satisfaction

CH A P T E R 4
Significant correlation for non-IT responses can be seen in table 18, those for IT responses can be seen in table 19.

It can be seen from table 16 that the higher importance non-IT respondents place upon management and customer participation in IT systems development, the less satisfied they are with the organisation’s response. Specifically, as importance increases with those factors relating to involvement in systems development, so the level of satisfaction for utility and ROI decreases.

Table 19 shows that participation and involvement is also an issue for IT respondents, who show an inverse relationship between importance and satisfaction for these items. Particularly interesting is the perfect negative correlation between top management involvement and priorities in allocating IT resources.

These results will be discussed further in chapter 5 section 5.3.3.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>COEFF</th>
<th>STRENGTH</th>
<th>SIGN</th>
<th>HIGH/Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top management involvement</td>
<td>Imp</td>
<td>.482</td>
<td>Moderate</td>
<td>.013</td>
</tr>
<tr>
<td>Perceived utility</td>
<td>Sat</td>
<td>.561</td>
<td>Moderate</td>
<td>.003</td>
</tr>
<tr>
<td>Ability of the systems to provide the greatest return on investment</td>
<td>Imp</td>
<td>.499</td>
<td>Moderate</td>
<td>.001</td>
</tr>
<tr>
<td>Customers participation in IT systems development</td>
<td>Imp</td>
<td>.561</td>
<td>Moderate</td>
<td>.003</td>
</tr>
<tr>
<td>Perceived utility</td>
<td>Sat</td>
<td>.561</td>
<td>Moderate</td>
<td>.003</td>
</tr>
</tbody>
</table>

Table 18 - Items within Strategic Issues dimension with a correlation coefficient > ± 0.4 – Importance and Satisfaction – non-IT responses
### Table 19 - Items within Strategic Issues dimension with a correlation coefficient > ± 0.4 – Importance and Satisfaction – IT responses

<table>
<thead>
<tr>
<th>ITEM</th>
<th>COEFF</th>
<th>STRENGTH</th>
<th>+/−</th>
<th>SIG</th>
<th>HIGH/LOW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ability of the systems to adapt to new demands or conditions</td>
<td>Imp</td>
<td>.917</td>
<td>Very strong</td>
<td>−</td>
<td>.029</td>
</tr>
<tr>
<td>Customers participation in IT systems development</td>
<td>Sat</td>
<td>.917</td>
<td>Very strong</td>
<td>+</td>
<td>.018</td>
</tr>
<tr>
<td>Ability of the systems to share common data and procedures</td>
<td>Imp</td>
<td>.918</td>
<td>Very strong</td>
<td>+</td>
<td>.028</td>
</tr>
<tr>
<td>Perceived utility</td>
<td>Sat</td>
<td>1.00</td>
<td>Perfect</td>
<td>−</td>
<td>.000</td>
</tr>
<tr>
<td>Top management involvement</td>
<td>Imp</td>
<td>1.00</td>
<td>Perfect</td>
<td>−</td>
<td>.000</td>
</tr>
<tr>
<td>Priorities in allocating IT resources</td>
<td>Sat</td>
<td>.918</td>
<td>Very strong</td>
<td>−</td>
<td>.028</td>
</tr>
<tr>
<td>Top management involvement with a capacity to help solve problems</td>
<td>Imp</td>
<td>.918</td>
<td>Very strong</td>
<td>−</td>
<td>.028</td>
</tr>
<tr>
<td>Effectiveness of the IT systems in their capacity to help solve problems</td>
<td>Sat</td>
<td>.918</td>
<td>Very strong</td>
<td>+</td>
<td>.028</td>
</tr>
<tr>
<td>Ability of the systems to provide the greatest return on investment</td>
<td>Imp</td>
<td>.918</td>
<td>Very strong</td>
<td>+</td>
<td>.028</td>
</tr>
<tr>
<td>Ability of the output to support decision-making</td>
<td>Sat</td>
<td>.918</td>
<td>Very strong</td>
<td>+</td>
<td>.028</td>
</tr>
</tbody>
</table>

4.1.10 **Independent t-Test**

Levene’s test was used to determine whether variances were equal between samples, therefore dictating which T statistic to use.

The test was first undertaken at item level. At this level, there was no significant difference between the mean of the two groups when assessing the importance of the items. Significant differences in the mean were only evident when assessing satisfaction (table 20). In order to aid clarity only those items showing a significant difference are listed.
The test was then carried out at dimension level (table 21). Please note the inclusion of the Strategic Issues dimension.

The results indicated that there was no significant difference between the 2 groups in the level of importance ascribed to each dimension, as might be expected given the consistently high importance ratings. However, the results show a significant difference between the 2 groups as to the level of satisfaction ascribed to the “System Quality” dimension. There is no significant difference between the 2 groups in the level of satisfaction for any other dimension.

The IT respondents are consistently less satisfied with systems quality than the non-IT respondents; the congruence between customers’ requirements and the resulting system (item 4), security of the system (item 6),

<table>
<thead>
<tr>
<th>ITEM</th>
<th>T</th>
<th>P</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>The congruence between the customers requirements and the resulting system</td>
<td>7.534</td>
<td>.000</td>
<td>Highly Significant</td>
</tr>
<tr>
<td>Security of the system</td>
<td>2.669</td>
<td>.012</td>
<td>Fairly Significant</td>
</tr>
<tr>
<td>Documentation of system and procedures</td>
<td>3.099</td>
<td>.004</td>
<td>Significant</td>
</tr>
<tr>
<td>Ability of the systems to adapt to new demands or conditions</td>
<td>3.656</td>
<td>.002</td>
<td>Significant</td>
</tr>
<tr>
<td>Access to internal and external training resources</td>
<td>2.553</td>
<td>.016</td>
<td>Fairly Significant</td>
</tr>
<tr>
<td>Technical competence of IT personnel</td>
<td>4.065</td>
<td>.000</td>
<td>Highly Significant</td>
</tr>
</tbody>
</table>

Table 20 - Independent t-Test, IT and non-IT staff - Satisfaction (Non-IT n=25, IT n=5)
documentation of systems and procedures (item 7), and the ability of the systems to adapt to new demands and conditions (item 8) all being scored significantly and consistently lower (tables 13 and 14). This is interesting when seen against the highly significant difference between the 2 groups when examining satisfaction scores for the technical competence of IT personnel (item 30), the IT organisation’s negative appraisal of their technical competence being the antitheses of the non-IT organisation’s appraisal (tables 13 and 14). The data show a similar pattern for access to internal and external training resources. From these results, inferences may be drawn as to the IT organisations self-image, their perceived place within the organisation, and the perception of senior management as to their need as a sub-group within the organisation as a whole. This is discussed further in chapter 5, section 5.3.2.
### Table 21 - Independent t-Test, IT and non-IT staff - Satisfaction (Non-IT n=25, IT n=5)

<table>
<thead>
<tr>
<th>DIMENSION</th>
<th>t</th>
<th>P</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>System Quality</td>
<td>2.919</td>
<td>.007</td>
<td>Significant</td>
</tr>
<tr>
<td>Information Quality</td>
<td>1.111</td>
<td>.276</td>
<td>Not Significant</td>
</tr>
<tr>
<td>Information Use</td>
<td>1.614</td>
<td>.117</td>
<td>Not Significant</td>
</tr>
<tr>
<td>Client Satisfaction</td>
<td>.763</td>
<td>.451</td>
<td>Not Significant</td>
</tr>
<tr>
<td>Importance to the Individual</td>
<td>.688</td>
<td>.497</td>
<td>Not Significant</td>
</tr>
<tr>
<td>Service Quality</td>
<td>1.686</td>
<td>.103</td>
<td>Not Significant</td>
</tr>
<tr>
<td>Conflict Resolution</td>
<td>1.416</td>
<td>.167</td>
<td>Not Significant</td>
</tr>
<tr>
<td>Organisational Impact</td>
<td>.531</td>
<td>.600</td>
<td>Not Significant</td>
</tr>
<tr>
<td>Strategic Issues</td>
<td>.327</td>
<td>1.518</td>
<td>Not Significant</td>
</tr>
</tbody>
</table>

4.1.11 Assessing the Success of Information Systems Implementation

During the semi-structured interviews, the interviewees (12 senior managers) were asked to consider, when assessing the success of a new system, how would they rank the following items:

- Return on Investment.
- Cost Reduction.
- Increased operating efficiency.
- User Satisfaction.
- System Usability.
- Strategic Fit.

The results of their consideration are shown in figures 11 and 12 below, and indicate an emphasis upon efficiency rather than effectiveness factors (with the exception of cost reduction). Figure 11 also shows the maximum and minimum rankings attributed by the interviewees, indicating a potentially wide dispersion of responses (supported by standard deviation data in table 22). Whilst the inferences mentioned above may therefore be drawn, there would also appear to be a lack of consistency in these responses. However, although the maximum and minimum values show in figure 11 reflect the dispersion, they also reflect and reinforce the ranking. These results will be discussed further in chapter 5, section 5.3.4.
Figure 11 - Importance assessment of specific IS success items

When assessing the success of a new system, how would you rank the following factors when compared to each other?

Table 22 - Standard Deviation of Responses

<table>
<thead>
<tr>
<th>Factor</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost Reduction</td>
<td>1.723</td>
</tr>
<tr>
<td>Strategic Fit</td>
<td>1.497</td>
</tr>
<tr>
<td>System Usability</td>
<td>1.303</td>
</tr>
<tr>
<td>Return on Investment</td>
<td>1.954</td>
</tr>
<tr>
<td>User Satisfaction</td>
<td>1.337</td>
</tr>
<tr>
<td>Increased Operating Efficiency</td>
<td>1.446</td>
</tr>
</tbody>
</table>
CHAPTER 4

4.2 RESULTS OF SEMI-STRUCTURED INTERVIEWS

The Qualitative Study

4.2.1 Content Analysis

Twelve interviews were undertaken at the organisations' offices in and around London.

Analysis of the interview transcripts brought to light a number of key themes, sub-themes and issues. The key themes and sub-themes are represented in figure 7, and are described in more detail below, along with associated issues. Illustrative quotes extracted from the interviews accompany the analysis.

Key Theme STRATEGY DEVELOPMENT

The development of organisational strategies was one that received mixed reactions. Those involved in strategy formulation were clear as to the nature and content of business and IS/IT strategies, those not involved were less clear – to the point of not being aware of their existence. The repercussions were a sub-optimal approach to systems development and procurement and a lack of integration and consistent management information. This Key theme and the associated issues will be discussed further in chapter 5, section 5.4.1.
Sub-Themes

A lack of structure and consistent understanding of strategic planning (n=9).

The failure to communicate and publicise strategy / business plan (n=10).

A lack of clarity as to the content and implications of the strategy (n=9).

Sub-optimality of decision-making leading to fragmentation of systems development and a lack of integrated management information (n=6).

Management perceptions of the nature of the organisations business environment (n=12)

The concern that here is a tendency for technology to drive systems development rather than the needs of the business (n=5).

Issues

There was an obvious lack of agreement as to the existence, content, and nature of a business strategy or plan. Those at a director level or those directly involved with the process of strategy formulation were clear as to the existence of a strategy, but the nature and scope of that strategy was less clear. Those managers at a less senior level were much less clear as to the existence of any type of strategy and its impact upon them. Issues of communication and clarity are also evident.
<table>
<thead>
<tr>
<th>Question</th>
<th>As far as you are aware, does the organisation have a business strategy?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response</td>
<td>“Yes it does. We talk about we don’t sometimes, but we have a business strategy that I think in our business is what I would call a moving strategy.”</td>
</tr>
<tr>
<td>Response</td>
<td>Yes, of course it has a business strategy. We are in business and we have been very successful over the past 10 years. We don’t have a bound and written on the shelf strategy, but if you put any member of the organisation in a room under exam conditions and ask them to write down what the strategy was, I’m pretty sure that you could pick anyone at random and they could come up with a pretty good idea of what the strategy was. But it’s not very structured.</td>
</tr>
<tr>
<td>Response</td>
<td>“We certainly have mission statements and are certainly developing strategies for each airport, looking forward and building 10-year plans, both revenue and capital.”</td>
</tr>
<tr>
<td>Response</td>
<td>“A business strategy? Yes, but don’t ask me what it is.”</td>
</tr>
<tr>
<td>Response</td>
<td>“It would be glib to say no, but sometimes it doesn’t look like it...It’s certainly not a publicised strategy, it’s not clear.”</td>
</tr>
<tr>
<td>Issue</td>
<td>A common theme was the fragmented nature of systems development, leading to a lack of integrated management information, failure to identify and take advantage of best</td>
</tr>
</tbody>
</table>
practice, inconsistent data structures and coding schemes, lack of clarity and consistency in requirements definition.

**Question**

How do you see fragmentation impacting upon IT developments?

**Response**

"Lots of ways, but one big example is coding. In property at the moment, it’s not unusual to find that they have one name and number for a building, and engineering have another, retailing have another, and finance have a different one again."

**Response**

"The real issue is that anyone who has a budget can spend it in any way they choose. So, if for example the fire service decided that they wanted a training records system, which you could argue the whole business needed...[they] would but a training records systems that would exist at a few locations for a few people. We would have a corporate system which would try and do something similar, and personnel would have one, but never the same one. Diversity is king."

A result of this fragmentation of systems is the perceived lack of integrated management information.

**Response**

"What that means is you don’t get any consolidation of information, it’s just too expensive."

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**Page 95**
Response

"The problem is the lack of integration of information and I can’t be bothered with going 'round to all the different systems to find out what I want to know – I haven’t got the time."

Issue

The nature of the business environment is highlighted as a reason for the strategy being a moving strategy. There is no consistent opinion as to the degree of stability of the environment, even at Director level. This raises issues related to the post-modern approach to strategy development, where the emphasis is upon equipping managers with the skills to be able to cope with change rather than developing long-term detailed strategies.

Question

How would you describe the organisation’s operating environment. On a scale of 1-10, 1 being very stable and 10 being very unstable?

Response

"About a 4. We’re more stable than unstable."

Response

"7. We have loads of influences on us that effect us, regulatory, and economy, and allsorts."

"...I think in our business it is what I would call a moving strategy, because it's the type of business where things change so therefore we have to continually review our strategy...We need to be much firmer on the basics of the values and
standards of what we stand for as a company, and I think that's what we haven't got in place yet.”

**Question**

There are those who advocate a post-modern approach to business strategy by stating that the dynamic and uncertain nature of the environment means that the best strategy is to have no strategy – just equip managers with the skills and tools to be able to anticipate and adapt to changes in the environment.

**Response**

"I think there is a bit of truth in that, but I think you do need this core strategy. I agree that managers have got to learn to be able to manage within a moving environment because that's how it is."

**Issue**

Following on from this, the issue of authority and leadership in IT systems development and procurement.

**Question**

So is there not a requirement when they come to procure IT to come through you?

**Response**

"We're trying to get to that point, but I can do nothing at the moment to stop somebody in Scotland going to a 3rd party and saying...write me a piece of software please...and they bring it back. In theory, the point at which I could stop it is when they try to put it on our network structure, but even then it's not as simple as it sounds, because there are whole sections of the structure not owned by IT."
Response

"I think that first of all it comes from leadership. For it to be effective you cannot give licence to other people to implement IT systems. As an IT function you have to have authority as well as accountability. That will be only thing that changes the way we operate. Until there is teeth whereby the leaders of the company say...this is the way we're going to do it."

Issue

A number of issues relating to the drivers of information systems development were raised. Particularly prevalent was the opinion that rather than the needs of the business being the main driver, is was often the case that there was a technical solution looking for an answer. There is a feeling that things are changing and that the needs of the business are being listened to.

Question

To what extent would you agree with the statement that, the process of change within the organisation is primarily driven by the technology itself rather than by the needs of the business?

Response

"I would say...it's a bit of both. It ranges from - technology can resolve all my problems – where it's quite obvious that technology is not the answer, through to people who will only turn to technology when they think they've exhausted everything else. Not many people get the balance right."

Response

"I would say that used to be the case, now we are listening to real practical business needs and not necessarily going for the
next whizzy-bang thing on the market. We're actually challenging, questioning and making sure there is a need. I think we're still learning, but I feel more comfortable.”

Issue

A number of interviewees were of the opinion that business objectives were unclear, and that this contributed to the failure of information systems. An alternative view was also put forward that whilst business objectives may be set, they are often heavily modified in the light of internal political pressure and ‘public’ opinion.

Question

Would you agree with the statement that systems within the organisation always meet the objectives set for them?

Response

I wouldn’t. I don’t think the objectives are properly set. I don’t think we start off with a clear idea of what we are trying to achieve.

Response

No – what objectives?

Question

What percentage would you say fail to meet the objectives?

Response

More than half. I’ve been in IT for 20 years and I don’t think it’s changed.

Response

.....90%. Mainly because we start to compromise on functionality and the effect on the business.....The reason I say this is that we modify the objectives to keep people on board.....it may well meet the objectives we come up with in the
end, but we tamper with them to make them fit. But if you’re asking how many fail to meet the up front business objectives I would say about 90%.

Key Theme

THE AWARENESS OF INFORMATION TECHNOLOGY BY BUSINESS MANAGERS

The awareness of IT by business managers may be viewed from 2 directions. Firstly, it emerges from the interviews that there is a reluctance to pursue personal development in IT skills and knowledge. A combination of lack of time, coupled with an informal, non-compulsory approach to IT awareness (and skills) training results in senior management relying primarily upon the IT professionals to keep abreast of technological developments and provide advice when called for. Secondly, there emerges a new breed of IT amateur from the business organisation who has some knowledge of IT development but, in common with the rest of their colleagues little appreciation of the rigour involved in successful IT development and the tendency towards unrealistic expectations. This will be discussed further in chapter 5 section 5.4.2.

Sub-Themes

The lack of awareness of IT, its application and the development process can lead to unrealistic expectations (n=5).
Training was identified as an emerging theme in the interviews, both in terms of its appropriateness, and the lack of compulsion to take advantage of it (n=8).

The IT interviewees believed that customers, or users, did not in general possess the right profile in terms of technical knowledge to be most usefully involved in systems development (n=2).

The personal development of IT skills was not seen as a priority by many of the business organisation interviewees (n=7).

The status of IT as a profession (n=4).

**Issue**

The nature and business managers often cited status of IT training as a reason for a general lack of awareness of IT. Two problems were particularly prevalent. Firstly, the amount of up-front training.

**Question**

Do the customers receive sufficient training to effectively use the systems?

**Response**

“We’re ok at doing the up-front training but sometimes we do too much training on a system they’ve never seen before and may not see again for several weeks. I believe that you should do about 70% of the training after the system has gone live and 30% up-front. We tend to put in 99% up-front and then the 1% when they realise they can’t use it properly.”
Response

“Clearly, when you install a new system, you need to start training people. I’m not certain we do that terribly effectively. We probably need some better support after about 3 months, when you’re comfortable with the system and have identified questions and areas where you need support.”

Secondly, the optional status coupled with the lack of priority assigned to training by some managers leads to training opportunities being missed.

Question

So did you receive any formal training?

Response

“Only for desktop. To a certain extent there was no compulsion in that, so it was a question of making yourself go and giving yourself the time. I only had the time to do the very basic level and some bits of it that would have been very useful I didn’t have time to do.”

Question

Would you say that you have received sufficient training to effectively operate the systems that you use?

Response

“No, but I think that’s partly my fault. I haven’t taken up all the opportunities. This is a problem in our company – this time thing – and again you should be careful with your priorities as the training could actually save you time”.

Page 102
Response  "No, but that's probably my own fault. I've been given the opportunity, I just haven't taken it up. I just muddle along with my old skills".

Issue Secondly, there would appear to be an assumption of prior or embedded knowledge.

Question Do you feel that the organisation should do more to keep you up-to-date?

Response "I think that there is a kind of assumption that we all know these things. It's a bit like finance, it's very difficult, but as you move up the organisation, to actually say - I don't understand; I don't know - isn't really on. It's like budgets, we never train our managers on budgets, we just assume that by the time you reach a certain position in the organisation, by osmosis you will understand how to manage a 2 million pound budget. To me that's a big training gap."

"The major frustration I've had is, is that there is an assumption that if you are female you can type and you know how to format letters. I've never been a secretary, I have no desire to be a secretary."

Question Do you think that part of the problem is that the technical people you are dealing with don’t understand the business you’re in and that there’s a middle ground that nobody quite sits in?
Response

"I think that there is an assumption that people understand certain things about computers and systems which maybe they don't."

Question

Do you think that it's because the people who put you in this position are computer literate and they just assume everyone's the same?

Response

There's a huge assumption that if you don't know, you'll find out very quickly, but with technology, because it's changing all the time, I don't think you can make that assumption.

Issue

Linked to this issue of an assumption of prior knowledge about IT is the issue of age.

“I'm of the generation and age that IT has come late in life, and I've struggled at the very basic level.”

Issue

An issue which emerged from the interviews as being an important connecting item for this theme was that of a general reluctance to pursue personal development, to make a point of keeping up-to-date with IT and its impact upon their business.

Question

Do you make a point of keeping up-to-date with business opportunities and difficulties arising from developments in new technology?
"Not as much as I should. I realise that there are huge gaps in my knowledge of loads of things like Internet and Intranet. I don't do as much as I could to keep up-to-date."

"I probably don't. I probably should. Our IT people do a pretty good job in making sure that we're aware of these things."

Do you feel that you were sufficiently equipped to fulfil the role asked of you?

"I'm not a tekkie. I'm not particularly strong IT-wise and to be honest I don't have a huge interest other than wanting the damn thing to work. There is a danger that we do take people out of the business and try to put them into inappropriate roles when it comes to IT, the danger being that we don't really understand what we're doing."

An issue relating to IT awareness that was of particular concern to IT people was the lack of understanding by customers — those potentially involved with, and with influence upon the development — of the process and rigour of systems development itself. This lack of specific knowledge, coupled with a general lack of understanding and naïveté towards IT can lead to unrealistic expectations.

Do you believe that in general most managers are technically naïve when it comes to IT?
“If I went to someone in airport operations and they told me that you can’t land planes on foggy days, I might ask a couple of questions, but at the end of the day I’d take their word for it. There are certain people in our business who, if I tell them we can’t do something, will argue with me and tell me we can. Everyone’s got their finger in the IT pie. They’ve got PCs at home, they’re all experts.”

Where customers have been involved, do you feel that they have been sufficiently equipped to fill the role asked of them?

“Not a chance... In terms of technical awareness they are in the dark ages. It’s not true of everyone. There are some out there who have great vision. But when it comes to almost pulling a punter off the street, they are not used to the rigour that is required in terms of project management. They have no experience of the disciplines, of the fact that computer systems are stupid... They just struggle massively, and that ranges from some fairly senior people to the average Joe.”

“People latch on to buzzwords and these end up as solutions looking for problems.”

Do you believe that the naivety of customers might place unrealistic expectations?
Response

They just can't understand why you can't do it now...I've got a picture on my wall by Renee Maigret [titled] "This is not a Pipe" – it's a picture of a pipe and it isn't a pipe, and this is the key. IT is like the pipe in the picture. It's not the real world. Everybody thinks it is. Unless you model it very well it just falls into disuse."

Issue

The status of IT as a profession and as a discipline was an issue to those working as IT professionals. They highlight this lack of status as perhaps emanating from ill-informed IT amateurs – a little knowledge being a dangerous thing.

Question

Do you feel that when they have been involved [in the development process], they have been sufficiently equipped to fulfil the role asked of them?

Response

"No. There's a real problem with understanding the way the development process works. They often see that developing IT systems is the same as building a car park. The problem they then have is that when a car park starts, if someone starts digging a hole in the ground 100 yards away from where the first hole was dug, someone's going to come along and ask – why are you digging here? With an IT system they think they can see the digger digging the first hole and every subsequent hole, and then when they can't, they tend to stand back and wait..."
until it’s finished. Then they say they didn’t want a car park, they wanted a shopping mall!”

“Everyone’s got their finger in the IT pie. They’ve got PCs at home. They’re all experts. If we [IT services] went out and started designing alternatives to Terminal 5, we’d get slapped about and told it’s none of our business, but if people at T5 start dabbling with IT – no problem.”

**Question**
Where does that force [for change] normally come from, does it come from within IT or from within the business itself?

**Response**
“It’s a 2-way street. I think that companies get the IT they deserve and there is a lovely quote from within the organisation that says that – we consider IT to be more important than landscaping, but only just! – and my experience would hold that to be true, but it is changing.”

**Issue**
The lack of status and understanding of the needs of IT is evident in the attitude towards professional training.

**Question**
Are you confident that the IT staff have the skills and knowledge to cope with the demands being placed upon them?

**Response**
“...We have badly under-invested in the IT side of the company over the last 10 years. We don’t have any professional Project Managers. We just say – here’s a project, you know a bit about this, so go. We have no career development. Technical people
just tend to drift into things...We have people coming in from other departments, like a secretary might be made redundant, so they say - stick her in IT, she'll be alright. Not as a secretary mind you, she's in my GroupWare team. What the bloody hell am I supposed to do with her...IT is the dumping ground.”

“...our training budget always gets cut, because it's seen as too expensive in relation to what other people get. I think it's the nature that IT changes so quickly. In other parts of the business...there are changes, but you don't wake up next morning to find out that someone's brought out some revolutionary piece of new technology that means your business could change overnight. In IT you can't afford to say – that's it, I've trained that person now, they'll be fine for a couple of years.”

Key Theme

THE AWARENESS OF THE NEEDS OF THE BUSINESS BY INFORMATION SYSTEMS DEVELOPERS

IS/IT developers are identified as failing to understand the needs of the business, and of using development in the technology drive the use of IT in the organisation. This is discussed further in chapter 5 section 5.4.3.
<table>
<thead>
<tr>
<th>Sub-Themes</th>
<th>A failure by IS systems developers to appreciate business priorities and needs (n=11). Communication barriers seem to be firmly in place, the business organisation failing to make the IT organisation aware of business issues (n=4). The emphasis upon technical training for those embarking upon careers in IT/IS (n=4).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Issue</td>
<td>Traditionally technology has been the driver for change, not the needs of the business. It is easy to assume that it is the IT specialist that emphasises the use of technology, but as the first response indicates, this is not necessarily the perception.</td>
</tr>
<tr>
<td>Question</td>
<td>To what extent would you agree that the process of change within the organisation is primarily driven by the technology itself rather than by the needs of the business?</td>
</tr>
<tr>
<td>Response</td>
<td>“.....It ranges from ‘technology can resolve all my problems’, where it’s quite obvious that technology is not the answer, through to people who will only turn to technology when they’ve exhausted everything else”.</td>
</tr>
</tbody>
</table>
| Response | “The business does not say to IT – here’s an issue, find us a solution. It still tend to be the IT who say that there are better solutions to what you are doing, and then trying to turn it back upon the business”.

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Response (IT)  “It’s difficult to say what came first, the solution or the problem. My view is that the technology tends to shroud the business problem. When you sit down and look at it, they may not have a technical problem at all.....It’s very rarely the right thing driving the development”.

Response (IT)  “I suspect that it is the technology that drives – or has done”.

Response (BUS)  “I think generally most big projects are driven by business need”.

Response (BUS)  “I think we have a few pockets of technologists who come up with solutions looking for problems. I don’t think we concentrate enough on solving the problems with technology. There’s a mismatch between business needs and solutions”.

Issue  A lack of 2-way communication between the system developers and the business customers

Question  To what extent do you think that those who develop the IT systems within the organisation appreciate and understand the business needs?

Response  “.....and this is a 2-way thing – I think the business needs to ensure that IT people understand as well as IT people having to seek and find. It’s not a 1-way street.....I don’t believe we do in all cases at the moment, but I think that it is within our remit to put things right”.

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Response

“Not well enough. They probably think they’ve put a fair degree of effort into it, but the system isn’t there. It’s a 2-way thing, and there’s not sufficient communication both ways. They speak in different languages”.

Issue

IT professionals are necessarily generalists, and often do not have a background in the industry which they work.

Question

To what extent do you think that those who develop the IT systems within the organisation appreciate and understand the business needs?

Response

“A lot of our IT people have a limited knowledge of the organisation. They come in from the outside because there’s no deep set IT background within the organisation. I suspect that we do have a slight mismatch – the people who are doing most of the detailed work are probably not familiar to any great extent - they can talk, but they’ve not actually experienced how the business operates”.

Response

“As technicians, we have often been through technical training that may gloss over – pay lip service to – business issues, but we are often generalists who in business terms can be described as jacks of all trades and masters of none”.

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CHAPTER 4

Key Theme

BARRIERS TO COMMUNICATION BETWEEN SYSTEMS DEVELOPERS AND THEIR CUSTOMERS

The barriers to communication between the 2 groups seems to stem from a poor relationship compounded (or perhaps caused) by the lack of a common language of systems development. The results are catastrophic in terms of IS success. The involvement and support of users and senior management has been at best sporadic, resulting in a fragmentation of systems development, poor integration, and very little sense of ownership from either of the 2 groups. This is discussed further in chapter 5, section 5.4.4.

Sub-Themes

No common language of systems development (n=12).

Poor relationship between the parties (n=10).

Ad-hoc and often ineffective user involvement in systems development (n=11).

A lack of top management involvement and support (n=8).

Little sense of system ownership (n=6).

Fragmented systems development in the context of general business fragmentation (n=7).
<table>
<thead>
<tr>
<th>Issue</th>
<th>Question</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>The nature of the organisation as a business and its degree of fragmentation can hamper the achievement of consensus in new systems design.</td>
<td>So, when it comes to project Enterprise, if the business strategy as a whole isn't clear, what's driving the needs analysis?</td>
<td>“.....but I think that to some extent if you let the airport go off and say this is the best process, they will come back with seven best processes. So Enterprise tries to get consensus and once they've get consensus then this is the process we'll use. But it's the business itself – in the same way we look at the business as being one sometimes – the business itself looks at the business as being more than one. So we say that the business has created this process so it must be good and they must be happy with it, but someone in operations might look at the process and say 'we weren't involved in that. That process was created by the procurement bit of the business and we weren't involved'.</td>
</tr>
<tr>
<td>The involvement of users in systems procurement is very patchy and seems to depend upon a number of variables. There is a general view however, that without user involvement the chance of a successful implementation is minimal. It also introduces the sub-theme of systems ownership.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Question

To what extent do the customers get involved in the development of systems within the organisation?

Response

“It depends upon which area and which application you are talking about. If you look at Enterprise, the team is built up entirely of business people; there are no IT people on the project.”

What's your impression of the other parts of the business?

“It varies enormously, from areas where there is no customer involvement, where we have the 'da-dah!' syndrome where the customer is presented with a surprise system, to project Enterprise where there is full involvement”.

Response

“.....again it's a bit patchy, it does vary. Some parts of the business want to own, embrace and put the resources into an IT project. Others are a bit more – bring it to me when it’s finished and we’ll have a look at it – and wonder why it’s not what they wanted”.

Issue

The above interviewee also introduced the notion that if users can see the need for an IT solution to an understood business need, they are more likely to want to get involved and less likely to resist the development. Carrying on from the previous response.....
“.....Sometimes I feel that people think that if someone’s pushing technology at a problem that they don’t perceive is there, so they resist it. Other times they know they’ve got a problem, they know they’ve got no choice, they need something. They may or may not agree that it’s technology, but it’s one option. So they are more likely to say ‘come and talk to us. Let’s sit down and work it out’.

Even when the users are involved, their attitude and level of commitment had impacted upon the relationship between the parties and the success of the development.

When they [the users] are involved, are they considered to be a valued member of the team?

“Again, a bit patchy really. Sometimes we’ve got people who range from – I’m the customer, just do as I say – people who really want to throw their weight around, to people – I don’t really want to be here. My boss sent me and I can give you an hour a week. Where they get the balance right they are considered a valued member of the team which is good, especially given our track record of giving them what they don’t want – albeit often what they asked for – but it’s not what they wanted”.
CHAPTER 4

<table>
<thead>
<tr>
<th>Issue</th>
<th>The organisation have created the role of Development or Account Manager. Someone who can act as an interpreter between the developers and their customers.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question</td>
<td>Do you feel that when they [the users] have been involved, they have been sufficiently equipped to fulfil the role asked of them?</td>
</tr>
<tr>
<td>Response</td>
<td>“No. There’s a real problem with understanding the way the IT development process works. They often see that developing IT systems is the same as building a car park.....It’s simpler to put up a building then change a bolt or a bit than to do the same with and IT system without screwing it up. We’ve got a few people who are starting to get that understanding now. Generally speaking the people sit between the IT heads and the business. They are Development Managers and deal with the interface – sort out the meaning”.</td>
</tr>
</tbody>
</table>

4.3 Summary of Results

Each of the two phases of the data gathering had its own specific objectives. These objectives will be reviewed in turn.

4.3.1 Phase 1 – Questionnaire Phase

- Objective 1 – to identify those factors deemed by management within the organisation to be most important to the successful implementation of an IT System.
CHAPTER 4

The results of the questionnaire were inconclusive. Both sub-groups (IT and non-IT) ranked all items high (between 5 and 7).

- Objective 2 – to determine the level of satisfaction of management with the organisation’s approach to those factors.

Responses tended to occupy the middle ground, respondents generally being neither particularly satisfied nor dissatisfied with the organisations’ approach. It was only when addressing objective 3 that a more interesting analysis starts to emerge.

- Objective 3 – to identify differences in the perceived importance and satisfaction ratings between IS and business management.

The non-IT sub-group generally considered items to be more important, and were generally more satisfied with the organisations approach than the IT sub-group. The IT group was particularly dissatisfied with items that defined or contributed to their own competence. Their non-IT colleagues, however, were not of the same opinion, generally indicating a high level of satisfaction as to the competence of IT staff. It is interesting also to note that the IT sub-group were generally more consistent in their responses for both importance and satisfaction. This may indicate a better-defined sub-culture, or may reflect the small number of IT respondents and will be discussed further in the next chapter. Also interesting and notable in the context of this research was the finding that the more the
respondents were in agreement as to which items were important, the more satisfied they were with those items. Whilst it is recognised that it is dangerous to conclude cause and effect, it does give cause to infer that there may be a relationship between strategy and IS satisfaction. This too will be discuss in more detail in next chapter.

4.3.2 Phase 2 – Semi-Structured Interviews

- To more fully understand the attitudes and opinions underpinning the issues raised from phase 1 of the research.
- To identify and investigate differences in attitude and opinion raised from phase 1 of the research between IS developers and IS customers (users).

The results of the analysis of phase 1 data led to the objectives of phase 2 being addressed together. It emerged from phase 1 that whilst application of the CSF instrument had limited value when analysed for the respondents as a whole, differences began to emerge when analysing the IT and non-IT sub-groups separately and then comparing the results.

The semi-structured interviews explored these differences, particularly in the context of strategy development and alignment. The results supported much of the secondary research in the literature review, highlighting a barrier between the 2 sub-groups reinforced by the lack of a commonly and consistently perceived strategy; be it business or IS/IT. What also begins to emerge is that the lack of consistency exhibited by the non-IT
respondents in their evaluation of the items contained in the CSF-based instrument – and paradoxically the consistency exhibited by the IT respondents in their responses – may be a reflection of the cultural characteristics of the 2 groups and would appear to be hampering the development of a positive organisation-wide IS culture.

It should now be clear that the results of the primary data gathering and analysis have justified the choice of research method and the strategies adopted within it. The choice of a multi-method approach within a case study has allowed the researcher to adopt a standpoint within the particular social context and observe and explore issues as the data might indicate, and has resulted in a rich picture of the defining characteristics and behaviours of 2 sub-groups within a particular organisational context.
CHAPTER 5

ANALYSIS, INTERPRETATION AND DISCUSSION OF RESULTS

This chapter will explore the results of the data analysis in the context of the aims and objectives of the research. It will also examine the limitations of the method in its conception and practical application.

5.1 Problems of data collection and the issue of control

As stated in the method chapter, flexibility was considered to be the key to the chosen method and, as it turns out, a significant degree of flexibility had to be exercised in the quantitative phase of data collection, with subsequent impact upon the qualitative phase. It was originally agreed with the organisation that 82 questionnaires would be sent out, 18 to selected members of the IT management across the organisation. This was reduced to 60 as at the last minute, the organisation withdrew permission for a particular sub-group to be contacted. No reason was given. This action impacted particularly upon the IT organisation in the sample, resulting in a sample size of six for this particular group. The repercussions were particularly consequential upon the qualitative phase of the data collection, reducing the number of IT management that could be drawn upon for interview.
The lack of control was an issue that could not be addressed. The organisation was made aware of the potential consequences of their action, but did not seem to attach enough importance upon the project to overcome their internal operational and political priorities. This in itself may be a reflection upon their attitude towards IT success, although it is probably more to do with the researcher being a very small cog stuck on to the outside of a very large and complex machine.

However, enough care had been taken with the purposive sample selection to ensure the quality of the data gathered in both phases of collection, even if the sample favoured the non-IT organisation more than would be desirable.

5.2 Limitations of the Research

Before going on to discuss the results of the data gathering, it is important to reflect upon the chosen strategy and identify its limitations, and what, with hindsight, might have been done differently. As discussed in chapter 3, case study research is founded upon the human interpretation and extrapolation of human situations. Smith (1990) identifies criticism of the validity and reliability of such an approach, but argues that:

“The validity of the extrapolation depends not upon the typicality or representativeness of the case but on the cogency of the theoretical reasoning”. (Smith, 1990)
A limitation of this research may be that the hypothesis being tested, in the context of the aims and objectives is perhaps too big. It may be argued that it encompasses too broad a theoretical perspective, leading to a watering down – perhaps a too wide-ranging interpretation of the data.

Whilst Smith (1990) reasons that:

"Providing the researcher has a basic grasp of the issues and remains close to the phenomena, meaningful research is likely to be conducted" (Smith, 1990),

the inclination in future would be to focus more sharply upon one aspect of the research area and design a case study that allowed for a deeper, more incisive analysis founded upon a richer theoretical foundation.

This limitation should not cast doubt upon the validity of these findings. The researcher had more than a basic understanding of the issues and remained as close to the phenomena as possible, therefore conducting meaningful, if wide-ranging research. It is more the result of a process of reflection upon how this type of research might better be conducted in the future.

5.3 The Questionnaire Phase

The aims of this phase of the research were quite simple and straightforward:
1. To identify those factors deemed by management within the organisation to be most important to the successful implementation of an IT System.

2. To determine the level of satisfaction with the organisation's approach to those factors.

3. To identify differences in the perceived importance and satisfaction ratings between IS organisation and business management.

The outcome of the quantitative phase was, using an existing (albeit modified) success factor-based measurement instrument, to gain a snapshot of opinion at one moment in time, and to contrast the results between the IT and non-IT organisation.

5.3.1 Response rates and issues of reliability

The response rate of 52% was considered poor but adequate. It was recognised that considerable variations of response rate can occur when collecting primary data (Saunders et al, 1997), but considering a supporting letter from the Personnel Director accompanied the questionnaire; adding weight and authority to the exercise, and follow-up reminder e-mails were sent, a higher response rate was expected.

The data gathered in this phase was generally considered to be reliable or approaching reliability (section 4.1.2.). There were however three dimensions that were not considered to be reliable when assessing importance, and one item within each of these that was causing that
unreliability (table 3) these were: within the Information Use dimension, item 20 – ability of the output to support decision-making; within the Client Satisfaction dimension, item 25 – ability of the systems to adapt to customers preferences and ways of working; within the Importance to the Individual dimension, item 29 – perceived utility. Item 25 can be disregarded from the analysis, as this item was added to the standard instrument to explore an area no longer relevant to this research. It would appear that this addition to the dimension did not fit the respondents understanding of what constitutes client satisfaction and its removal greatly improves the reliability. Subsequent correlation of factors within the remaining two dimensions (section 4.1.3.) indicates that factors 20 and 29 do not seem to fit within their respective dimensions, each of the other two factors achieving a significant correlation.

It was therefore decided to include these factors in a new dimension – Strategic Issues (section 4.1.4). The factors included in this dimension were all considered to be either a prerequisite to, or the consequence of a strategic approach to IS design and implementation i.e. understanding and meeting customer requirements, adaptability and integration, involvement of the non-IT organisation in systems procurement and development, priority allocation and timetabling of the provision of IT products and services, the ability of the systems to aid decision-making and solve problems, and issues of control and ownership. They were also considered to be factors that fell more logically into the category of effectiveness.
rather than efficiency when placed within DeLone and McLean's Categories of IS Success model (figure 4) and as such could be seen as requirements to the development of a positive IS culture. These factors did not purport to be exhaustive; they were purely selected from those included in the measurement instrument.

The reliability of this new dimension proved to be high both for importance and satisfaction responses (table 11), indicating the logic of including such a dimension in future applications of this survey instrument, although further work would be required to identify the definitive content. It does not however, prove the validity of the survey instrument in measuring information systems success, but highlights a possible omission in past applications.

5.3.2 Perceptions of Importance and Satisfaction

At dimension level, the results were inconclusive. Importance levels were high (table 15) for all dimensions with coefficients of variation ranging between 1.7 and 5.8, indicating a moderate consistency of response. There was no discernible pattern of consistency across the technical, semantic, or effectiveness levels (figure 4). No strong feelings were evident for satisfaction responses (table 16) although the coefficients of variation indicated less consistency of response. Once again, there was no discernible pattern of consistency across the technical, semantic, or effectiveness levels.
For both Importance and Satisfaction, the difference between the highest and lowest mean rating was less than one, therefore making it difficult to make judgements about most and least. However, it is interesting to note that for Satisfaction, the only dimensions to achieve a mean rating less than four were those particularly concerned with effectiveness – Organisational Impact and Strategic Issues. The Strategic Issues dimension also had the highest coefficient of variation, indicating an inconsistency of response.

There was no correlation between Importance and Satisfaction at this level, but subsequent analysis found a very significant strong positive correlation between the coefficients of variation (coeff. .928 sig. .000) for these two variables (figure 10).

This finding is particularly important in the context of this research. One of the main precepts is that traditional measures of IS success reflect and encourage sub-optimal behaviour, and thus make it impossible to formulate an agreed set of factors that constitute IS success. This strong and highly significant positive correlation indicates that as the level of agreement increases as to what is important to IS success, so the level of agreement increases as to how satisfied the population is to the organisation’s approach. This is not to say that the level of satisfaction per se increases, but that where a common set of norms and values has been created as to what is important, a consistent response to the organisation’s approach to those norms and values is evident. This relationship should
not automatically be seen as a positive asset to the organisation, as it may be more to do with towing the company line rather than a rational common response to better understanding of the business goals and the role of IS in pursuit of them. However, the relationship does exist and deserves further exploration. For the purposes of this discussion, the relationship is interesting in the context of the lack of a common understanding of the business strategy of the organisation. The relationship described above indicates that consensus may only be achieved through a common perception of what is important and as this common perception not exist, there can be no agreement as to the level of satisfaction – hence the lack of correlation between Importance and Satisfaction.

This finding, whilst demanding further exploration, is supported by the work of Williams (1958) and Bodley (1994) who state that a tendency towards idiosyncratic behaviour and attitude derives from the lack of a set of common meanings and direction – the lack of a common culture.

At item level, looking at the responses firstly as a whole, a similar picture emerged to that when analysing at dimension level. For importance all factors were rated high (table 12), with responses for satisfaction occupying the non-committed middle ground. Respondents were more in agreement as to the level of importance than to the level of satisfaction, this being supported by the independent group’s t-test, which found no significant difference between the two groups for Importance (section 4.1.10.) However, the data did show significant differences is the mean
responses for satisfaction between the 2 groups, particularly for certain items within the system quality dimension. Also at item level, the t-test (table 20) showed a highly significant difference between responses with regard to the technical competence of the IT personnel, the IT respondents being less satisfied with their own competence than the non-IT respondents (item 30, tables 13 and 14). They were also less satisfied with access to internal and external training resources (item 21, tables 13 and 14). Subsequent interviews would support these differences, as the IT group were particularly concerned that the organisation did not understand the particular training needs of IT specialists, resulting in an IT group, who define their role and position within the organisation in terms of their technical expertise, being unable to maintain that position. This would seem to suggest that there is still an inadequate appreciation by senior business management of the complexity and demands of successfully deploying IT and that not a great deal has changed in practice since the work carried out by Tomlin (1991) and Willcocks (1991).

In general, the IT organisation was more consistent in its responses (section 4.1.7.). This consistency may be due to the small sample size, but it also may reflect a clearer and more common understanding of what they believe to be important in systems development. The consistent dissatisfaction with the organisation's approach may be a collective cultural response to an inadequate appreciation by senior management of
what is needed to successfully deploy IT – an inadequacy supported by Tomlin (1991) and discussed later in section 5.4.2.

5.3.3 **Perceptions of Importance and Satisfaction for factors within the Strategic Issues dimension.**

The involvement of top management and customers participation in IT systems development produced strong significant negative correlation for both IT and non-it respondents, both groups becoming progressively less satisfied with the organisation’s approach to factors relating to utility, ROI, adaptability, and problem solving, as their perception of their importance rose. This was particularly true for IT respondents, who showed a very strong correlation for these participatory factors, especially for Top management involvement and Priorities for allocating IT resources where there was a perfect negative correlation between importance and satisfaction. This view comes as no surprise, “top” management involvement and support having already been identified as being at the heart of organisational issues relating to IS failure and abandonment (Ewusi-Mensah and Przasnyski, 1994; Neumann, 1994). It is also supported later in the discussion, where both groups acknowledged the importance of user participation in systems development but were unwilling or unable to make it happen (section 5.4.4.).
5.3.4 What measures would managers use to assess the success of a new system: efficiency or effectiveness?

The results of the quantitative data indicate a lack of common perspective as to what is important to the success of IS implementations. Further investigation (section 4.1.11.) showed a tendency to focus upon achieving increased operating efficiency and user satisfaction, with strategic fit being ranked 5th out of six factors under consideration, so a focus upon efficiency rather than effectiveness, however it is interesting to note that actual cost reduction was considered to be least important when assessing the success of a new system.

The change of emphasis from "efficiency" to "effectiveness" projects identified by Fitzgerald (1998) would therefore appear to have some way to go: the tendency to take a narrow, perhaps even sub-optimal view on what constitutes success still being prevalent.

5.4 The Semi-Structured Interview Phase

This phase of the research had two objectives:

1. To more fully understand the attitudes and opinions underpinning the issues raised from phase 1 of the research.

2. To identify and investigate differences in attitude and opinion between IS developers and IS customers, raised from phase 1 of the research.
CHAPTER 5

The interviews on the whole went well, interviewees being happy to talk freely about their experiences of IS implementation within the organisation. Whilst the interviewer did have an interview plan (appendix 3), the method rationale allowed the flexibility to explore certain areas in depth and modify subsequent interviews based upon important and relevant issues raised. This allowed the interviewer to identify and focus upon the key themes and issues as they arose, and avoid spending too much time exploring what transpired to be symptoms arising from these issues.

Analysis of the interview transcripts brought to light a number of key themes, sub-themes and issues. The main key themes and issues are discussed below.

Whilst the interviews themselves met the objectives set for them in terms of the flexibility offered and depth of understanding achievable, the lack of control over the number of interviewees and their profile, resulted in a less than ideal breadth of survey. It order to best achieve the aims and objectives of the research, particularly when exploring the relationship between the IT and business organisations, it would have been preferable to ascertain the views of a broader range of IT managers in order to facilitate more meaningful and focused analysis and comparison. However, it was possible to identify broad themes and issues that could be used to meaningfully explore the hypothesis and go some way to satisfying the aims and objectives of the research.
5.4.1 Strategy Development

A common theme that emerged from the interviews was the fragmented nature of systems development within the organisation, leading to a lack of integrated management information, failure to identify and take advantage of best practice, inconsistent and duplicated data structures and coding schemes, lack of clarity and consistency in requirements definition.

Alongside this fragmented, piecemeal approach to systems procurement, was an obvious lack of agreement as to the existence, content, and nature of a business strategy or plan. Those at a director level or those directly involved with the process of strategy formulation were clear as to the existence of a strategy, but the nature and scope of that strategy was less clear. Those managers at a less senior level were much less clear as to the existence of any type of strategy and its impact upon them. Issues of communication and clarity were also evident, inasmuch as there would appear to have been a failure to effectively communicate or cascade the strategy down through the organisation. A process had taken place to set objectives and targets for specific business units, but the relationships between these controls and the strategic aims of the organisation were not evident to most of the sample. It was also evident that the linkages between units had not been taken into account by many of the legacy systems in place within the organisation.

The perception of the organisation’s business environment was highlighted as a reason for the lack of a clear and consistently applied strategy. There
was no consistent opinion as to the degree of stability of the environment, even at director level, opinion ranging from very stable to very dynamic. This is interesting when put in the context of Anthony et al (1972) who suggest that the lack of a clear and common understanding of the nature of the business environment supports a general inability to create a common vision of what is critical to successful IS.

5.4.2 The awareness of IT by business managers

Business managers often cited the nature and status of IT training as a reason for a general lack of awareness of IT. Two problems were particularly prevalent. Firstly, the optional status of IT training coupled with the lack of priority assigned to training by some managers leads to training opportunities being missed. Secondly, there was a concern as to the amount of up-front training that users receive. Too much up-front training on new systems or technology was considered to be inappropriate. Better to provide on-going training that addressed the needs of the users as they are modified in the light of experience.

There would appear to be an assumption of prior or embedded IT knowledge. One interviewee likened it to the assumption that all managers could manage a budget and use a spreadsheet, or all women managers know how to use a word processor, and that this knowledge is somehow acquired by osmosis once a certain grade is reached.
An issue which emerged from the interviews as being an important connecting factor for this theme was that of a general reluctance to pursue personal development, to make a point of keeping up-to-date with IT and its impact upon their business. Reasons given were lack of time and that it was the IT organisation’s job to keep them up-to-date with new developments.

An issue relating to IT awareness that was of particular concern to IT people was the lack of understanding by customers – those potentially involved with, and with influence upon the development – of the process and rigour of systems development itself – and that this lack of specific knowledge, coupled with a general lack of understanding and naivety towards IT often lead to unrealistic expectations. The following is a quote from an IT Manager that illustrates this well:

“If I went to someone in airport operations and they told me that you can’t land planes on foggy days, I might ask a couple of questions, but at the end of the day I’d take their word for it. There are certain people in our business who, if I tell them we can’t do something, will argue with me and tell me we can. Everyone’s got their finger in the IT pie. They’ve got PCs at home, they’re all experts”.

The status of IT as a profession and as a discipline was an issue to those working as IT professionals. They highlight this lack of status as perhaps emanating from ill-informed IT amateurs – a little knowledge being a dangerous thing.
The perceived lack of status and understanding of the needs of IT were said to be illustrated in the business's attitude to professional IT training. It was felt that the rapid pace of technological change coupled with the cost of providing appropriate training to IT professionals meant that there was a reluctance to invest the amounts required to develop and keep good people.

A lack of awareness of IT by professionals supports the views of Ward and Peppard (1996), Tomlin (1991), and Willcocks (1991), but is now modified on the light of the "IT amateur" who perhaps has an appreciation of the possibilities offered by IT, but has little appreciation of the rigour of systems procurement, implementation, maintenance and support.

5.4.3 The awareness of the needs of the business by information systems developers

There is a perception that technology plays too important a role in driving change. That often the IT organisation has a technology solution that is looking for a problem and that all too often the technology tends to shroud the business problem.

A lack of 2-way communication was highlighted by both IT and non-IT managers as being a problem. It was felt that the IT organisation tended to sit in splendid isolation from the rest of the business, endorsing the idea of compartmentalisation, and cultural exclusivity suggested by Wetherbe
(1988). However, this was just as much the fault of the business organisation as the IT organisation.

The business organisation viewed the IT specialists as generalists in their knowledge of business as there was little immersion in the actual operation of the business on a day-to-day basis. This view was shared by the IT organisation, but they believed that the problem lay more in the technical education they had been through over the years that often “glossed over – paid lip service to business issues”.

5.4.4 **Barriers to communication between systems developers and their customers**

The nature of the subject organisation and its degree of fragmentation were seen to hamper the achievement of consensus in new systems design. With no guiding strategy, various parts of the business would often “do their own thing”, acquiring new systems that often duplicated those elsewhere, whilst failing to ensure consistency of coding. There was also a reluctance to embrace new systems where there had been no involvement in their procurement.

The issue of the lack of a common language of systems development was raised from both sides of the business. The dearth of understanding of each other’s perspective precluded communication, and led to the active withdrawal of IT staff from user contact. Development staff were actively
encouraged not to talk to users as a way of avoiding conflict and misunderstanding.

Symptomatic of this barrier to communication is the patchy and rather ad-hoc involvement of users in the procurement of new systems. Supporting the views of Ewusi-Mensah and Przasnyski (1994) and Willcocks (1991) as to the positive contribution of users to systems development, there was a consensus that user involvement was vital to the successful implementation of IS, but in this case actual involvement depended upon the particular business function or individual(s) concerned.

"It varies enormously, from areas where there is no customer involvement – where we have the “da-dah” syndrome where the customer is presented with a surprise system, to others where there is full involvement"

"...again it’s a bit patchy, it does vary. Some parts of the business want to own, embrace and put the resources into an IT project. Others are a bit more – bring it to me when its finished and we’ll have a look at it – and wonder why it’s not what they wanted”.

The above interviewee also introduced the notion that if users can see the need for an IT solution to an understood business need, they are more likely to want to get involved and less likely to resist the development.

Carrying on from the previous response...

"Sometimes I feel that people think that someone’s pushing technology at a problem that they don’t perceive is there, so they resist it. Other times they know they’ve
got a problem, they know they’ve got no choice, they need something. They may or may not agree that it’s technology, but it’s one option. So they are more likely to say ‘come and talk to us – let’s sit down and work it out’.

Where they do get involved, the IT organisation does not always view them as valued members of the team. The IT organisation perceives them as either wanting to ‘throw their weight around’ or as not being willing or able to invest the time and commitment to make the involvement worthwhile. This supports the findings of Wong and Tate (1994) who also identified a low appreciation by the IS organisation of the need for user involvement.

Underpinning all of the themes is the lack of common terms of reference guiding the procurement of information systems. This lack of a collective goal may in part be due to the relatively stable nature of the organisation’s business environment, which has allowed the view to develop that a strategic approach to IS implementation has been, and continues to be unnecessary to gain and maintain competitive advantage. The focus has therefore been upon systems that gain operating efficiency rather than strategic fit. This is supported in the research by the rather sub-optimal view of what constitutes success and the fragmented approach to systems procurement. To use Von Clausewitz’s metaphor - without a common understanding of the purpose of the war and its strategic objectives, how can the commanders identify those battles of strategic significance? It is
more likely that each commander will behave sub-optimally, the result perhaps, being a won battle but a lost war.

5.5 Research Aims Revisited

Aim:

- To explore the suitability of “traditional” measures of information systems success to contemporary business organisations.

It was clear from the review of the literature that a CSF approach to determining information systems success was inherently flawed. Its focus upon the deliverable components, upon technical aspects of IS did not take into account the perceived need to address broader sociotechnical and organisational issues, particularly the need to address issues of strategy. The review also placed this firmly in the context of the development of a positive IS culture; this being identified as a prerequisite of successful IS deployment. It identified the predisposition of the CSF approach for the reinforcement of sub-cultures rather than the formulation of shared values and norms.

Analysis of the primary data supported many of the broader issues raised by the literature review. It brought to light many of the barriers to the development of organisational culture and suggested that a process by which a common IS culture can be developed must be undertaken before there can be general agreement as to what constitutes success – before CSFs have any validity.
Aim:

- To determine the role of the strategic alignment process in determining IS success.

The literature review identified the importance of a strategy to underpin and justify the development and deployment of IS. What became clear from discussion of the results is that the lack of a guiding strategy was one of the main reasons for a rather efficiency-focused, fragmented and sub-optimal approach to systems development and deployment. It also became clear that without a process based upon a policy of inclusion the barriers of language and culture between the two sub-groups could not be addressed.

Linking all of these themes, would seem to be the requirement for the organisation as a whole to have a clear and consistent understanding of the priorities and policies governing the development of IS, for as the data would indicate, this appear to be a pre-requisite of IS satisfaction. The next chapter will examine these issues more fully and draw conclusion as to the synergetic role the process of strategic alignment might play in achieving what might be described as a positive IS culture, and the relationship between this and IS success.
CHAPTER 6

6 CONCLUSION AND RECOMMENDATIONS

This chapter will draw conclusions from the discussion in chapter 5 and make recommendations for a model of IS success and further research.

6.1 Preliminary conclusions

Perhaps the most important conclusion arising from the analysis of the quantitative data is that as consensus increases as to what factors are important to the successful implementation of IS, so does the consensus as to whether or not those factors have or have not been successful. This in itself might seem common sense, but it indicates that where positive action is taken to create common values and norms – to create a common IS culture – an optimal view of what constitutes success is also engendered. It would be taking inference too far to suggest that in this case the process of strategic alignment was the catalyst for any consensus that occurred within the organisation, but it would be reasonable to infer that where the process of strategic alignment does occur, consensus should result.

What is evident from this study is that IS success when defined in the context of strategic alignment has two dimensions. Firstly there is the process of strategic alignment, and secondly there is the end result – strategic fit.
6.1.1 The positive effect of the strategic alignment process upon the development of IS culture

Four key themes arose from the analysis of the interview transcripts:

1. The failure of the organisation to effectively communicate their business or IT strategies (see paragraph 5.4.1.)

2. The lack of awareness of IT by business managers (see paragraph 5.4.2.)

3. The lack of awareness of the needs of the business by information systems developers (see paragraph 5.4.3.)

4. Barriers to communication between systems developers and their customers (see paragraph 5.4.4.)

Underpinning all of the themes is the lack of common terms of reference guiding the procurement of IS. This lack of a collective goal may in part be due to the relatively stable nature of the organisation's business environment, which has allowed the view to develop that a strategic approach to IS implementation has been and continues to be unnecessary to gain and maintain competitive advantage. The focus has therefore been upon systems that gain operating efficiency rather than strategic fit. This is supported in the research by the rather sub-optimal view of what constitutes success and the fragmented approach to systems procurement.

The development of a positive IS culture is dependent upon experience modifying learned behaviour i.e. positive and constructive communication
between the IS and business organisations, building bridges across the gap in understanding that past educational and commercial experiences has created. The perceived exclusiveness and separateness of the IT organisation precludes or mutates this modification and is evident in the idiosyncratic behaviour of some staff which is implicitly encouraged within the organisation by keeping the parties separate. Basically, there is a failing of both groups to develop the common threads required for successful cultural development.

Analysis of the data does indicate a general appreciation of the benefits of taking a strategic approach to IS development, so why is the emphasis on efficiency when evaluating IS success? The interviews identified a common perception that information systems commonly failed to meet their objectives, but also stated that strategic objectives were all too often not clearly defined or communicated. The management did not have a clear and common vision of the organisational strategy. A failure to cascade the strategy means that the linkages between strategy, infrastructure and process cannot be put into place (figure 13). The effect of this is to further isolate the IT organisation from the rest of the business and entrench the sub-optimal behaviour of many managers.
But what is to be gained from establishing these linkages, and how will a strategic approach to measuring the success of IS implementation break down barriers and put in place a positive IS culture? The author suggests that the traditional CSF approach is too broad a front. As Von Clausewitz (cited in Rockart, 1979) states, resources should be focused upon the few battles of significance. If managers were to measure success in terms of how well information systems supported the strategic objectives of a department or business unit, optimality could be assured and resources utilised in a mutually agreed way.

Within the organisation, the fragmented nature of the business, coupled with little clear or common vision of goals or strategies means that the establishment of mutually agreed and understood CSFs is virtually impossible. Even where a vision is shared, the traditional CSF approach concentrates upon the technical and semantic stages of DeLone and
McLeans’ categories of IS success model, focusing upon user satisfaction. After all, IT-based information systems may be a technical masterpiece that the user is very satisfied with, but if that satisfaction is based upon sub-optimal criteria, it cannot be successful in organisational and strategic terms. The traditional CSF approach therefore reinforces the fragmented nature of systems development.

Evaluating the success of an information system in terms of its strategic alignment consequently re-focuses the attention upon the effectiveness of the business. But perhaps more importantly, the process of strategically aligning IS and the business is one of inclusion. It is one that requires a mutual understanding by both the IT and business organisation of the linkages required at a strategic level, and also at an infrastructure and process level. It requires and encourages lateral and vertical communication as part of the cascade process and forces the development of common terms of reference, a common language of systems development that works to break down barriers to communication. Inclusion rather than separateness is also the key to cultural evolution. It is the factor that enables the bridges to be built across the cultural divide and facilitates the acquisition of experience and subsequent modification of behaviour needed for a positive IS culture to exist.
6.1.2 The end result – Strategic Fit

Secondary data gathering by means of reviewing the literature highlighted the importance of strategic fit in ensuring IS success. The increasingly turbulent nature of the business environment placing increased decision-making demands upon business managers and hence placing extra demands upon the nature and scope of information to support that decision-making. However, in addition to the support role of strategically aligned information is the increasing role of IS as a driver of strategy in pursuit of competitive advantage.

It is suggested that strategic fit is the ultimate measure of IS success, as only by aligning the use of information and the technology that supports it, can organisations hope to gain competitive advantage.

6.1.3 The strategic alignment synergy

The process of strategic alignment is not purely a means to an end. It is a process by which a positive IS culture can be developed, where common terms of reference can be developed that define those factors which constitute success and which are optimal in their focus. It is a process that encourages inclusion and cross-fertilisation of ideas and knowledge, breaking down the walls between the IS specialists and their customers.

The research tells us that for a large, fragmented organisation, strategic alignment is the most important, if not the only determinant of IS success.

Traditional measures reinforce the sub-optimal tendency in IS
development and help to build the wall between the IS and business organisations even higher. It shows a recognition by managers of the importance of strategic or effectiveness factors but demonstrates that without the common vision and language of development that comes from a process of strategic alignment these managers are locked into measuring the success of their IS investments purely in terms of efficiency. The author would suggest that the logical conclusion is that it may be wrong to try to measure the success of ISs at all. Measurement implies that the system is an end in itself, rather than an integral tool used in the pursuit of competitive advantage. Technical, semantic and effectiveness factors are all elements that work together in an information system to provide the best tool for the job, but it is the job that is of ultimate importance. The process of achieving strategic fit is one of cascading measurable targets and goals. If a strategically optimised target is achieved, then the IS that support the activities in pursuit of that target can be said to be successful. That target may be related to efficiency or effectiveness but the important fact is that it is optimal.

Traditional success factors still have their place within this strategic focus. Technical and semantic factors are important constituents of good information systems, they may be seen as quality indicators and will in turn effect the performance of IS and ultimately their effective strategic deployment, but they are the components that pursue the strategy.
6.2 Research Hypothesis Revisited

It is appropriate at this time to restate the postulated hypothesis.

"Strategic fit is the dependent variable of information systems success".

The primary and secondary evidence strongly supports this. It is the process of strategic alignment together with the resultant organisational change that determines success.

6.3 A model for IS success

![Figure 14 - The Information Systems Success Model]

Continuous Multi-Disciplinary Education & Development
As a consequence of this study, the above is proposed as a model for IS success. The model consists of 3 dimensions, the FOUNDATIONS, the STRUCTURAL INTEGRITY, and the ROOF.

The FOUNDATIONS consist of 3 levels:

1. At the deepest level is the need for multi-disciplinary professional education and development. The IT component of business courses needs to be covered in more depth to equip graduates with the language and base of knowledge needed to keep track of developments in new technology and allow them to think freely as to how it may be applied within business. Whilst not all computing students will work in business upon graduation, there will always be value gained by learning about the process of strategy formulation and strategic alignment. For those studying Business Information Systems or Business Information Technology courses, the business component of the course should also be strengthened. It is vital that those studying a particular discipline should be adequately skilled in that discipline. However, the research shows that a major barrier to the successful development of information systems within business is compartmentalisation. Compartmentalisation leads to a breakdown of communication, fragmentation, and ultimately sub-optimality.

Education provides the base for free thinking, but this needs to be continually developed as part of a structured professional
development programme. The benefits would be more effective user involvement in systems development, better prioritisation of support, maintenance and enhancement by IT staff, faster recognition of business opportunities offered by developments in new technology, better alignment of IS and IT strategies to business goals, and perhaps most importantly the ability of IT and their customers to communicate effectively.

2. The middle level consists of the business strategy itself. The business strategy provides the direction for the business in the medium to long term and is used as the basis for subsequent strategies, goals and targets. The temptation was to place the business strategy at the deepest level, however there were a number of reasons for not doing so. The process of strategy formulation at this level is one that requires individuals at a senior level to be free thinking and analytical about many different factors affecting the business both now and in the future. A broad grounding in business together with a knowledge of issues and developments in IT is vital if any environmental scanning is to be complete and comprehensive as possible. The process of strategy formulation (and this applies at subsequent levels as well) may also be viewed as an exercise in communication between individuals from a variety of backgrounds, resulting in a strategy that is not only a statement of intent, but is
also the vehicle for the formulation of a common language between those individuals.

3. The top layer of the foundations is the **communication** layer. The formulation of a business strategy has no value to the business – it is a pure cost – unless it is acted upon, and it can only be acted upon if it is communicated to and understood by each and every employee in the business. This communication may take a number of forms, but perhaps most importantly, its contents must be cascaded to form the basis of subsequent Information and IT strategies and, in turn, lower level objectives, goals and targets. The communication and cascade of the business plan is in itself an information system and it is critical that structures and channels are set up to ensure that this information is communicated effectively.

The pillars placed on top of the foundation, and which support the ROOF in the form of the IS and IT strategies can be viewed as providing the **STRUCTURAL INTEGRITY** of the model. The pillars represent the IT professionals and business professionals who are both required to work together to support the development of information systems within the business. If one should fail to work effectively with the other, the strategy process will fail and without the strategy, successful, optimal systems cannot be developed.

Providing the correct foundation has afforded management with the skills, knowledge, structures, and direction from which successful IS and IT
strategies can be developed and it is these strategies that put in place the policies, objectives and structures which ensure that information systems are developed that are aligned to the business strategy, integrated across the business, and which have clear, measurable objectives and benefits. As with the formulation of the business plan, the process itself, and the involvement of both IT and Business professionals will also guarantee that a common language of systems development is formulated and used as a basis for subsequent communication.

6.4 Contribution to existing theory

This case study achieves what it set out to, within the limitations and opportunities offered by the method. It has added weight to the importance and role of the strategic alignment of information systems to their ultimate success, but does this with reference to the part CSFs have played in the measurement of IS success.

As discussed in chapter 3, the case study allows for a human interpretation of human situations. In this case it is believed that existing theory relating to the role of strategic alignment in determining IS success was explored, and sound interpretations of data made in the context of a large, global, “blue-chip” organisation that is going through an evolutionary shift in the way it approaches the development of IS: a shift that is being similarly undertaken by many organisations around the world.
Its main contribution therefore, may be that of currency; “fixing” theory in a real world context and using that context to explore issues surrounding that theory. These issues have then been used to create a model by which the relationships a that may exist between these issues are shown and which may be used to stimulate further research.

6.5 Recommendations for future research

As has already been discussed in chapter 3, one of the characteristics of case study research is that of data currency. The case study unshackles the researcher from the requirement to ensure data integrity, and allows an interpretative standpoint to be taken. The need to test, at some point, the replicability of the findings and move towards data integrity is recognised, but this is not yet the time.

This case study has allowed an analysis to be undertaken at one point in time, and emerging from that analysis has been a model, representing a set of dimensions within which IS success may be attained. However, the organisation within which the case study was set has embarked upon a shift in culture and process by which many of those barriers to IS success identified in this research are being addressed. It is therefore recommended that a longitudinal research strategy is adopted whereby further case studies are used within the organisation to identify changes in behaviour at a number of points in time (Vitalari, cited in Kanungo, 1993, p258). As Kanungo (1993) argues that only this design can, with proper
controls, make statements about changes in structure. He goes on to state that:

"Longitudinal designs make it possible to include open-ended questions and measures to access attitudes and values and permit the researcher to observe and analyse the way in which the values change over time. *It seems to be the only way to combine the rigour associated with traditional empirical enquiry while studying the simultaneous development of values and attitudes and their impact on other variables*". (Kanungo, 1993)

These case studies should work to identify changes in values and attitudes within the theoretical boundaries of the dimensions contained within the IS success model, and identify whether changes in the models' dynamics result in changes in peoples' perceptions of IS success.

Returning to one of the original justifications for this project, management are demanding more value from their IT investments. Galliers (1993) argues that to ensure a cross-fertilisation of ideas, approaches to research need to be taken that are based upon real-world situations rather than "experimental elegance". A case study method within a longitudinal design will ensure that the IS success model is explored in a real-world context where its findings are immediately relevant to management.
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The following are a list of dimensions and factors of information system success covered by Bailey and Pearson's ISS instrument. They are enhanced by additional dimension and factors (*) proposed by E.Y. Li, who establishes an organisational context for the analysis.

**System Quality**

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
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<tbody>
<tr>
<td>13</td>
<td>Response/turnaround time between request for service and the reply</td>
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<tr>
<td>15</td>
<td>Convenience of access</td>
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<tr>
<td>23</td>
<td>The vocabulary, syntax, and grammatical rules used to interact with the CBIS</td>
</tr>
<tr>
<td>25</td>
<td>The degree of congruence between the user requirements and resulting CBIS</td>
</tr>
<tr>
<td>26</td>
<td>The policies and methods governing correction of system errors</td>
</tr>
<tr>
<td>27</td>
<td>Security of the CBIS</td>
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<tr>
<td>28</td>
<td>Documentation of systems and procedures</td>
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<tr>
<td>38</td>
<td>Flexibility of the systems to adapt to new conditions, demands, and circumstances</td>
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<tr>
<td>39</td>
<td>Functional integration of the systems</td>
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**Information Quality**

<table>
<thead>
<tr>
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<th>Description</th>
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<tbody>
<tr>
<td>16</td>
<td>Accuracy of output</td>
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<tr>
<td>17</td>
<td>Timeliness of output</td>
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<td>18</td>
<td>Precision of output</td>
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<td>19</td>
<td>Reliability of output</td>
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<td>Currency of the output</td>
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<td>Completeness of output</td>
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<td>Format of the output</td>
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<td>41</td>
<td>Clarity of output</td>
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<td>42</td>
<td>Instructiveness of output*</td>
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**Information Use**

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<tr>
<td>24</td>
<td>Volume of output</td>
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<tr>
<td>46</td>
<td>Provision of knowledge resources for decision support</td>
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**User Satisfaction**

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<tr>
<td>1</td>
<td>Top management involvement</td>
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<td>4</td>
<td>Schedule of charges and procedures for assessing resource utilisation</td>
</tr>
<tr>
<td>32</td>
<td>Users confidence in the system</td>
</tr>
<tr>
<td>33</td>
<td>Users participation</td>
</tr>
<tr>
<td>49</td>
<td>Adaptability of system tools to users personal information seeking preferences</td>
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<tr>
<td>43</td>
<td>The quantity and quality of available hardware and software*</td>
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**Individual Impact**

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<tbody>
<tr>
<td>29</td>
<td>Users expectation of CBIS</td>
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<tr>
<td>36</td>
<td>Job effects of CBIS</td>
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<tr>
<td>31</td>
<td>Perceived utility</td>
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<td>47</td>
<td>Access to learning/training resources</td>
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**Service Quality**

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<tr>
<td>7</td>
<td>Technical competence of the CBIS staff</td>
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<td>8</td>
<td>Attitude of the CBIS staff</td>
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<tr>
<td>9</td>
<td>The timescales for provision of CBIS services</td>
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<td>10</td>
<td>The time elapsed between requests for, and provision of new CBIS services</td>
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<td>11</td>
<td>Processing of requests for system changes</td>
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<td>12</td>
<td>Type and quality of hardware/software vendor support</td>
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<td>14</td>
<td>Means of input/output with CBIS</td>
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<td>30</td>
<td>Users understanding of the system</td>
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<td>35</td>
<td>Training provided to users</td>
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**Conflict Resolution**

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<td>2</td>
<td>Competition between CBIS and non-CBIS units</td>
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<tr>
<td>3</td>
<td>Allocation priorities for CBIS resources</td>
</tr>
<tr>
<td>5</td>
<td>Relationship between users and the CBIS staff</td>
</tr>
<tr>
<td>6</td>
<td>Personal control over the CBIS</td>
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<tr>
<td>34</td>
<td>Organisational position of the CBIS unit</td>
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<tr>
<td>35</td>
<td>Users attitude toward using the CBIS</td>
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**Organisational Impact***

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<td>Productivity improved by the CBIS*</td>
</tr>
<tr>
<td>45</td>
<td>Efficiency of the systems*</td>
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<tr>
<td>46</td>
<td>Effectiveness of the systems in its capacity to help solve problems*</td>
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Section 1

Success Factor

System Quality
1. The means by which the customer inputs data and receives output
2. Accuracy of output
3. The language used to interact with the systems
4. The congruence between the customers' requirements and resulting system
5. The policies and methods governing correction of system errors
6. Security of the system
7. Documentation of systems and procedures
8. Ability of the systems to adapt to new demands or conditions
9. Ability of the systems to share common data and procedures

Information Quality
10. Accuracy of output
11. Timeliness of output
12. Level of detail
13. Reliability of output
14. Output up-to-date
15. Completeness of output
16. Format of output
17. Clarity of output
18. Completeness of output

Information Use
19. Quantity of output
20. Ability of the output to support decision-making
21. Access to internal and external training resources
<table>
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<tr>
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<td>1. Ability of the IT systems to provide the greatest return on investment</td>
<td>22. Top management involvement</td>
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<td>2. Productivity improved by IT systems</td>
<td>23. Customer involvement in the system development</td>
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<td>7. Processing quality of requests for system change</td>
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<td>33. The means by which the customer inputs data and receives output</td>
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<td>20. Time allocated between requests for and provision of IT services</td>
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<td>45. Customer's participation in the system</td>
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<td>25. Adaptability of the systems to customers' preferences and ways of working</td>
<td>46. Customer's participation in the system</td>
</tr>
<tr>
<td>26. Impact upon the individual</td>
<td>47. Effectiveness of the IT systems in their capacity to help solve problems</td>
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</tbody>
</table>

**Scale:** 1 = Not at all important, 2 = Marginally important, 3 = Slightly important, 4 = Moderately important, 5 = Very important, 6 = Very important, 7 = Most important

**Notes:**
- Each cell represents a factor and its importance level.
- Factors are arranged based on the importance level.
Section 2

Just a couple of more personal questions to help us in our analysis. Please circle the appropriate answer.

Your age?  <20  20-29  30-39  40-49  50-59  60-69  >69

Your sex?  M  F

Many thanks for completing the questionnaire
APPENDIX 3 – SEMI-STRUCTURED INTERVIEW PLANS
Non-IT
Interview Schedule
Critical Success Factors in IT-Based Information Systems Implementation

Background Briefing
My name is Mike Snelgrove, from the University of Wales Institute, Cardiff, and I am undertaking a research project in collaboration with ***. The purpose of the study is to understand and analyse ***'s approach to those factors critical to the success of Information Technology-based Information Systems.

Please note that
1. All views expressed are confidential and non-attributable
2. If requested, each interviewee will receive a copy of the report
3. Whilst some questions may not relate to your direct experience, your opinion would still be much appreciated

- What is your normal role?
- What does this normally involve?
- Is the use of IT-based information systems an integral part of your job, or the jobs of those who work for you?

- As far as you are aware, does *** have a business strategy?
  - Are you familiar with its contents and how they relate to you in your role?
- To the best of your understanding, does *** have a strategy that guides the development of its IT based information systems?

Some general questions about how systems are developed within *** and your role within this development
- To what extent do you think that those who develop the IT systems appreciate and understand the business needs?
- To what extent would you agree with the statement that "the process of change within *** is primarily driven by developments in the technology itself, rather than by the needs of the business"?

- Have you been involved in the development of IT-based Information Systems within ***?
  - If yes
    - In what way?
    - Did you feel that you were sufficiently equipped to fulfil the role asked of you?
    - Were you made to feel a valued member of the team?
    - Could your knowledge and skills have been used more effectively?
  - If no
    - Why not?
    - Do you think you should have been?
- If conflict occurred between Project Managers and Users, whose views would usually prevail
- Do you feel that you have had an influence on the systems development?
Who do you feel owns the systems you use?

Do you make a point of keeping up-to-date with business opportunities and difficulties arising from developments in new technology?
  > If yes
    * How?
  > If no
    * Why not?
  > Do you believe that *** should do more to keep you up-to-date?

Do you believe that in general most managers within *** are technically naïve when it comes to IT?
  > If yes
    * How might this be addressed?

Do you see *** as an integrated or fragmented organisation?
  > If fragmented
    * Do you see this fragmentation impacting upon IT developments?
  > If integrated
    * Do Info Systems within *** support this integration?

Questions about system use

To what degree do the systems match the original requirements?
To what extent do you actually use the systems, compared to your original expectations?

Task Support – support of clerical and operational activities

To what extent could you get along without using the systems?
Would you say you are dependent upon these systems?
  > Try to discover critical and non-critical systems
To what extent do the systems provide information that seems to be just about exactly what you need?
Would you agree with the statement that “by using these systems, I can do my job better”?

Decision-making Support – support of management and control activities

Do the systems enable you to make better decisions?
Are you a more effective manager by using these systems?
Would you say that these systems help you to be a more innovative manager?

Design and useability

To what extent do the systems overload you with more data than you could possibly use?
To what extent are the systems troublesome to you
Are the systems friendly and easy to use?
How would you describe the documentation provided to the users?
- Sufficient/insufficient/too much
- High quality/low quality
- Complete/incomplete
- Useful/useless
- Easy to use/not easy to use
- Clear/unclear
- Variable

Relationship with IT staff
- How would you describe the relationship between IT staff and their customers?
- Are you confident that the IT staff have the skills and knowledge to cope with the demands being placed upon
- Do you agree with the statement that "too much time elapses between requests for and provision of IT services"?

Training
- Have you received sufficient training to effectively operate the systems?
- Have you received sufficient training to understand and use the outputs from the systems?
- Have you received sufficient training to understand and capitalise upon the job effects of the introduction of new technology?

Performance
- Do you feel that the systems in place are sufficiently flexible to adapt to changes in ***'s operating and trading environment?
  - On a scale of 1-10, with 1 representing very stable and 10 representing very unstable, where would you place ***'s operating environment?

- To what extent do you feel that the information systems in place within *** capitalise upon the knowledge capital or organisational memory of ***.
  - How might *** benefit from capturing and sharing this knowledge?

- When assessing the success of a new system, how would you rank the following factors in order of importance?
  - Increased operating efficiency
  - Return on investment
  - System usability
  - Cost reduction
  - Strategic fit
  - User satisfaction
Would you agree with the statement that "***'s investments in IT always achieve the objectives set for them"?
  ➢ If no
    ▪ What % fail to achieve the objectives?

To what extent have the systems within *** successfully included consideration of the following issues?
  ➢ Their contribution to business goals and needs?
  ➢ Their impact upon organisational structures and processes?
  ➢ Their impact upon work organisation and job design?
  ➢ Their usability?
  ➢ Their impact upon health and safety?
  ➢ Their ergonomic aspects?
  ➢ Their impact upon training and skills?

Are they good value for money?
  ➢ ROI

Are there any topics you would like to raise?
Is there anything we've missed?
THANK YOU
IT

Interview Schedule

Critical Success Factors in IT-Based Information Systems Implementation

Background Briefing

My name is Mike Snelgrove, from the University of Wales Institute, Cardiff, and I am undertaking a research project in collaboration with ***. The purpose of the study is to understand and analyse ***’s approach to those factors critical to the success of Information Technology-based Information Systems.

Please note that
1. All views expressed are confidential and non-attributable
2. If requested, each interviewee will receive a copy of the report
3. Whilst some questions may not relate to your direct experience, your opinion would still be much appreciated

❖ What is your normal role?
❖ What does this normally involve?
❖
❖ As far as you are aware, does *** have a business strategy?
   ➢ Are you familiar with its contents and how they relate to you in your role?
❖ To the best of your understanding, does *** have a strategy that guides the development of its IT based information systems?
❖

Some general questions about how systems are developed within ***
❖ To what extent do you think that those who develop the IT systems appreciate and understand the business needs?
❖ To what extent would you agree with the statement that “the process of change within *** is primarily driven by developments in the technology itself, rather than by the needs of the business”?
❖ To what extent have the users been involved in the development of IT-based Information Systems within ***?
   ➢ If they have
     ▪ In what way?
     ▪ Did you feel that they were sufficiently equipped to fulfil the role asked of you?
     ▪ Were they considered to be a valued member of the team?
     ▪ Could their knowledge and skills have been used more effectively?
     ▪ If conflict occurred between Project Managers and Users, whose views would usually prevail
     ▪ In general, do you feel that the users have had a positive influence on the systems development?
   ➢ If not
     ▪ Why not?
• Do you think they should have been?

• Who do you feel owns the systems used within ***?

• Do you make a point of keeping up-to-date with business opportunities and difficulties arising from developments in new technology?
  > If yes
    • How?
  > If no
    • Why not?
  > Do you believe that *** should do more to keep you up-to-date?

• Do you believe that in general most managers within *** are technically naïve when it comes to IT?
  > If yes
    • How does this manifest itself?

• Do you see *** as an integrated or fragmented organisation?
  > If fragmented
    • Do you see this fragmentation impacting upon IT developments?
  > If integrated
    • Do Info Systems within *** support this integration?

• To what degree do the systems match the original requirements?
  > If not, why not?

• How would you describe the documentation provided to the users?
  > Sufficient/insufficient/too much
  > High quality/low quality
  > Complete/incomplete
  > Useful/useless
  > Easy to use/not easy to use
  > Clear/unclear
  > Variable

Relationship with IT staff

• How would you describe the relationship between IT staff and their customers?

• Are you confident that the IT staff have the skills and knowledge to cope with the demands being placed upon them?

• Do you agree with the statement that “too much time elapses between requests for and provision of IT services”?
Training
- Do the users receive sufficient training to effectively operate the systems?
- Do the users receive sufficient training to understand and use the outputs from the systems?
- Do the users receive sufficient training to understand and capitalise upon the job effects of the introduction of new technology?

Performance
- Do you feel that the systems in place are sufficiently flexible to adapt to changes in ***'s operating and trading environment?
  - On a scale of 1-10, with 1 representing very stable and 10 representing very unstable, where would you place ***'s operating environment?
- To what extent do you feel that the information systems in place within *** capitalise upon the knowledge capital or organisational memory of ***.
  - How might *** benefit from capturing and sharing this knowledge?
- When assessing the success of a new system, how would you rank the following factors in order of importance?
  - Increased operating efficiency
  - Return on investment
  - System usability
  - Cost reduction
  - Strategic fit
  - User satisfaction
- Would you agree with the statement that "***'s investments in IT always achieve the objectives set for them"?
  - If no
    - What % fail to achieve the objectives and why?
- To what extent have the systems within *** successfully included consideration of the following issues?
  - Their contribution to business goals and needs?
  - Their impact upon organisational structures and processes?
  - Their impact upon work organisation and job design?
  - Their usability?
  - Their impact upon health and safety?
  - Their ergonomic aspects?
  - Their impact upon training and skills?
- Are they good value for money?
  - ROI

Are there any topics you would like to raise?
Is there anything we've missed?
THANK YOU
APPENDIX 4

APPENDIX 4 – A SELECTION OF INTERVIEW TRANSCRIPTS
Interview 1

*What is your normal role?*

I am applications manager which means I am responsible for all applications and IT development except for the development of the Applications which I am not responsible for. Largely that’s separated out into 2 large programmes of work – one called airport operations and the second is Enterprise which is a large multi-million pound, far more than just technology, the also involve process – they are their own separate strings of work. I am also responsible for applications support and developing professional resources such as project managers, some of whom will go into those projects, technical people as well and Oracle people. Those people will all work for me and go off on secondment for a day, a week, a year. So that’s largely my role.

*As far as you are aware, does ?? have a business strategy?*

A business strategy? Yes, but don’t ask me what it is..

*Are you familiar with its contents and how they relate to you in your role?*

Not specifically, no. I know some of the objectives of the business at a high level, but a lot of it’s just mission statement level.

*To the best of your understanding, does ?? have a strategy guiding the development of its IT based information systems?*
No. Other people might tell you we do, but I can’t see any evidence of it. It’s very ad-hoc. You might point to project Enterprise and say that’s different, but it’s very piecemeal. It’s reactive rather than proactive.

*To what extent do you think that those who develop the IT systems within ?? appreciate and understand the business needs?*

I would say that, with the probable exception of Enterprise – the way it’s being tackled; starting with the business and the processes, with very little technology so far – very poor, but Enterprise will be the exception to that.

*Enterprise is dealing primarily with back-of-house systems, across the whole business?*

Yes, it’s a centralisation exercise, and I would think that to date about 90% of the effort has been about the business and only about 10% about IT. It will remain very much driven by the business processes and the business requirements and strategy rather than a technical solution looking for an answer, which is what most of the stuff we do at the moment is.

*To what extent would you agree that the process of change within ?? is primarily driven by the technology itself rather than by the needs of the business?*

I would say…..it’s a bit of both. It ranges from “technology can resolve all my problems” where it’s quite obvious that technology is not the answer, through to people who will only turn to technology when they think they’ve exhausted everything else. Not many people get the balance right, where they say “we have a problem – lets get together a whole group of people, including technology people, and ask what are the possible answers”, and the possible answers may range from knocking that wall down so people
can talk to each other through to an e-mail system and beyond. So quite poor really. It really does depend who you talk to. From our point of view, we’re not very good at coming up with new technology in advance, saying here’s something that could help you. When we do and said here’s some technology, do you want it, they’ve said yes, but we don’t want to pay for it. People want it, but no one wants to sponsor it or own it. Then we’ve go a client saying “we’ve got a business problem, we want an intranet” It’s difficult to understand what came first, the solution or the problem. My view is that the technology tends to shroud the business problem. When you sit down and look it, they may not have a technical problem at all. It’s not black-and-white that one I’m afraid. We’ve probably got the full spectrum. On balance it doesn’t work particularly well. It’s very rarely the right thing driving the development.

*So when it comes to Project Enterprise, if the business strategy as a whole isn’t particularly clear, what’s driving the needs analysis? Is it going to each individual....bit and asking what’s needed?*

No. I’m not really an expert on Enterprise, but my understanding of how it came about was that originally it was sold by 2 or 3 IT people at a very senior level who thought it was the right thing to do. It was sold to very senior ??? people along the lines of “why do we need all these different mechanisms for paying bills/ Why do we need 7 accounts payable systems? And got them interested by talking about cost and productivity. Also in a customer service perspective, improving the processes. The way they deal with it was really to say look at the processes and they really go for best practice processes and they try to involve people, but I think that to some extent if you let the airport go of and say this is the best process, they will come back with 7 best processes. So Enterprise tries
to get consensus and once they’ve got consensus than this is the process we’ll use. But it’s the business itself – in the same way we look at the business as being one sometimes – the business itself looks at the business as being more than one. So we say that the business has created this process so it must be good and they must be happy with it, but someone in operations might look at the process and say “we weren’t involved in that, that process was created by the procurement bit of the business and the finance bit of the business and we weren’t involved”. But as a general principle is that this is the agreed best practice process, this is what will happen across the business.

*So was it driven by a perceived need to integrate the various parts of the business?*

Yeah, integration, I guess. Whether the business saw it ...... if you’d asked they at the time or even now, they might not say it.

*To what extend do the customers get involved in the development of systems within ????*

It depends a huge amount. It depends on the type of system. If we’re putting in a groupware system then they need to be quite heavily involved because its custom built largely around a package and we don’t know what those processes are – you couldn’t not involve them. Traditionally we may say well a general ledgers a general ledger, do here you are. So again, a bit patchy, it does vary. Some parts of the business want to own, embrace and put the resources into an IT project. Others are a bit more...bring it to me when its finished and we’ll have a look at it... and then wonder why it’s not what they wanted. Again it does vary enormously. Often dependant on the real pressures in their business areas and the real business pressure to apply technology to a particular problem. Sometimes I feel that people that someone’s pushing technology at a problem that they
don’t perceive is there, so they resist it. Other times they know they’ve got a problem, they know they’ve got no choice, they need something. They may or may not agree that its technology, but its one option, so they are more likely to say...come and talk to us, lets sit down and work it out.

*Do you feel that when they have been involved, they have been sufficiently equipped to fulfil the role asked of them?*

No. There’s a real problem with understanding the way the IT development process works. They often see that developing IT systems is the same as building a car park. The problem they then have is that when a car park starts, if someone starts digging a hole in the ground 100 yards away from where the first hole was dug, someone’s going to come along straight away and ask “why are you digging here?” With an IT system they think that they can see that digger digging the first hole and every subsequent hole, and then when they can’t, they tend to stand back and wait until its finished. They then say that they didn’t want a car park, they wanted a shopping mall. Also, with something like a car park or an office block, largely, what is required is a change. Its simpler to put up a building then change or bolt on a bit than to do the same with an IT system without screwing it up. We’ve got a few people who are starting to get that understanding now.

Generally speaking the people sit between the IT heads and the business – they are development managers and deal with the interface – sort out the meaning. There’s only 2 or 3 and that’s the problem.

*When they are involved, are they considered to be a valued member of the team?*
Again, a bit patchy really. Sometimes we’ve got people who range from..."I’m the customer, just do as I say" – people who really want to throw their weight around, to people..."I don’t really want to be here – my boss sent me and I can give you a hour a week. So it does vary. Where they get the balance right they are considered a valued member of the team which is good, especially given our track record of giving them what they don’t want – albeit often what they asked for – but it’s not what they wanted.

*If conflict occurred between project managers and users, whose views would usually prevail?*

That’s something that’s again changed quite a lot. 10 years ago..."we’re IT, tough if you don’t like it"....then we went the other way to...”oh, you want that do you? Shall I tell them that won’t actually work? We’ll give it to them anyway”... about 5 years ago we put in a personnel system that was clearly designed for 100 employees – they saw the functionality, said they wanted it – so we rolled this thing out for 7000, 8000 employees all over the place. The thing was a disaster and they said..."why didn’t you tell us?".

We said that it was what they asked for. So we went too far the other way. I’d like to think we’ve reached a balance now, and they might not agree with this, but we had a case recently where they said that they had this system developed and we want to roll it out now, and we said no, we have to roll it out for you or find something more appropriate for our network. So at the moment they think we’re getting in their way, but I think we’ll find a balance. I think we’re closer to that balance now than we have been in the last 10 years, but it does tend to swing with the pendulum.

*So, is there not a requirement when they come to procure IT to come through you?*
We’re trying to get to that point, but I can do nothing at the moment to stop somebody in Scotland going to a 3rd party and saying...”write me a piece of software please”...and they bring it back. In theory, the point at which I could stop it is when they try to put it on out network structure, but even that’s not quite as simple as it sounds, because there are whole sections of the structure not owned by IT. For instance the network at Gatwick is owned by Clearing. There are still bits of the structure at Stanstead owned by Engineering there – they don’t want to relinquish it. So, if we owned the entire infrastructure, when people tried to do this we’d say...”sorry, we’re not prepared to put this on the directory structure – we feel it’s inappropriate – we’ll now help you get something sensible, but you’ve wasted some money”. But it’s still not easy.

**In general, do you feel the users have had a positive influence on systems development?**

I think that if you look at the money we’ve spent on IT in the last few years, the bulk of the money they have, in terms of the individual number of systems, probably not. In the past 2 or 3 years things have improved quite a bit..

**Who do you feel owns the systems used within ????**

Not simple again really. I mean there are some systems that the business community own. For instance there is the property system that we have virtually nothing to do with now, apart from running our eyes over change specs to make sure they are not being ripped off by the supplier... They control introducing changes, enhancements – all that sort of stuff. There are other systems that I now own or have inherited that the business still are looking for us to do all the administration and all this sort of stuff. Things that I consider the user should control. So it does vary. The move is to make the business own
the systems and there are...again, if you’d asked me the question 2 years ago I’d have said that IT own them all. Now I’d say largely IT, but not in every case and the trend is toward getting the business to own them. But I’d say that we are 5 or 10 years away from achieving that.

*So what do you think the difference is between Property, who feel they own the systems and another customer who doesn’t?*

Take Property. They asked for something to deal with some problems they had. They’d made some promises to their customers that they weren’t able to meet without major change. There was quite a lot of support for change at a senior level. And they recognised the need to get involved to get it right. So they’ve been on the ball with it pretty much all the way through. So, although we’ve had a few problems. When we’ve highlighted those areas and they’ve helped us out for a bit. Take something like Maximo – a maintenance management system/fault reporting. The people at the coal face were pretty happy with it. The reason for replacing it was that it was old, it wasn’t very friendly to the network, there were faults, it didn’t meet any of our technical standards, so it needed replacing, and also we wanted to do a lot of preventive maintenance sort of stuff which we couldn’t do on our system. We’ve had so much trouble getting the people to use and accept the system that owning it is the icing on the cake.

*Do you make a point of keeping up-to-date with business opportunities arising from developments in new technology?*

Not me personally. I mean I have done. Until recently I was heavily involved with Property, so I visited other businesses to find out what they were doing both from a
business and technical point of view. It could be that we might identify technology looking for a problem. We’re generally a bit slow to pick up new technology. We are short on resources and we tend to push them into giving the customers what they want and supporting what they’ve got. In fact there’s a disproportionate amount in supporting in relation to developing. I inherited 33 people and have 32 on support and 1 on development. Some who do support do development as well, but the split is not right.

Do you believe that in general most managers are technically naïve when it comes to IT?

Yes.

What sort of problems does that cause?

There is a belief that everything is fixable. We had a problem recently which manifested itself on the desktop – a system that was running live, and we went to Lotus and they said that there was no problem fixing it and it would be fixed in the next release – in about 9 months. So we went back to the people concerned and their attitude was that it wasn’t good enough, just get it fixed. Again, with a building, you can always fix it – somehow there will be a resolution. But with IT systems, especially as they become more and more integrated, and there’s a knock-on impact, it’s not that simple. We do get some of these people throwing their weight around saying…”just fix it, I’m a customer”… but we can’t – we sorry but we can’t.

Do you think it comes down to expectation – to managing the users expectation?

If I went to someone in Airport Operations and they told me that you can’t land planes on foggy days, I might ask a couple of questions, but at the end of the day I’d take their word for it. There are certain people in our business who if I tell them we can’t do
something will argue with me and tell me we can. Everyone’s got their finger in the IT pie, they’ve got PC’s at home, they’re all experts. If we went out and started designing alternatives to terminal 5, we’d get slapped about and told it’s none of our business, but if people at T5 start dabbling with IT – no problem. They’ve come up with their own mail system, management systems, but if we tried to do this, they’d get a bit stressed. But there is this expectation that everyone can dabble with IT. They’re not all like that, but the majority of people I deal with are.

*Do you see ??? as an integrated or fragmented organisation?*

Fragmented.

*So how do you see that fragmentation impacting upon IT developments?*

Lots of ways, but one big example is coding. In property at the moment, it’s not unusual to find that property have one name and number for a building and engineering have another, retailing have another, and finance have a different one again. We’re not only fragmented across airports but we’re also fragmented within airports. So that coding is the biggest single issue. The users say...”why can’t you take that bit of data from that system into another one?”...the problem is that you’d need a conversion table for every single piece of data, and it’s taken a long time to make users understand why coding is an issue. And even now I think half the people don’t really understand why it’s a problem until they come across an issue and try and do something about it. There are other problems. If I want to put in a system, I reckon I should be able to sit down with 2 or 3 key business people to discuss the requirements. Generally speaking I would have to sit down with at least 1 per airport, and with the bigger airports, several. So when I sit down
with my working group, I’m talking about a group of maybe 10, 15, 20 people, and when they don’t agree they don’t agree, and we spend half our time fighting. If there were just 2 or 3 key people and they could speak for the business it would be wonderful. But it just doesn’t happen and that makes all of our development expensive and high risk because you’re never talking to quite the right people.

*So is there any way round that?*

There’s not short term way round it. There is a slow, general realisation that this is an issue, but I couldn’t say that we were cracking on to solve it.

*Now down to perhaps more mundane matters. How would you describe the documentation provided to users?*

Again, it’s a bit patchy. We try to now put as much as possible online, with context help. The evidence is that if you give people a manual, it sits on the shelf and gathers dust. It’s one of those things we’ve been wrestling with some time to get it right, and I think the online option is the best.

*How would you describe the relationship between IT staff and their customers?*

Using organisation changes we’ve been trying to take away most contact between IT staff and customers because people who are basically technical people don’t know how to deal with customers, don’t want to deal with customers and find it very frustrating. We’re trying to bring in the Account Managers – people with business knowledge – to sit between the technical people and the business, to get the business requirements, make them sensible and give them to us. We can then deliver, contract it out to an IT company or whatever. And I think that’s been driven by the fact that we’ve had some pretty awful
experiences of people getting frustrated with dealing with both customers and IT people in both directions. So, not great, but we've put something in place to try and improve it. But they speak a different language to us and visa versa, so we need an intermediary.

*Are you confident that the IT staff have the skills and knowledge to cope with the demands being placed upon them?*

No, nowhere near.

*So what are they lacking, technical skills?*

Everything. We have badly under-invested in the IT side of this company over the last 10 years. We don’t have any professional Project Managers, we don’t train people to be Project Managers. We just say...”here’s a project, you know a bit about this, so go”...We have no career development. Technical people just tend to drift into things. There’s no real development path for them. We have people coming in from other departments, like a secretary might be made redundant, so they say stick her in IT she’ll be alright – not as a secretary mind you – she’s in my Groupware team. What the bloody hell I’m supposed to do with her? So lots of people tend to drift into IT. ??? are very good at passing plonkers around. We don’t get rid of them, we just move them around and IT is the dumping ground. We’ve also had a recruitment freeze of permanent staff in ??? for about 5 years now. Out of 130 staff, about 70% are contractors. If they were all to leave we’d be stuffed. We have very few in-house technical skills.

*So is this lack of career development and training throughout ??? or is it particularly bad for IT? Do you feel you have been neglected more than others?*
We’re not alone, but I’m sure there are people doing better than us. The problem with IT is that the company says that there is a certain part of your budget dedicated to training. That’s fine, but if you send someone on a retail management course, it probably costs about 1/3 of an IT technical course. And so I end up with one course per person per year, whilst someone else will get 2 or 3 courses for that. That’s always a bit of a bugbear.

Our training budget always gets cut, because it’s seen as being too expensive in relation to what other people get. I think it’s the nature that IT changes so quickly. In other parts of the business such as retail management, there are changes, but you don’t wake up next morning to find that someone’s brought out some revolutionary piece of new technology that means your business could change overnight. In IT you can’t afford to say…”that’s it, I’ve trained that person now, they’ll be fine for a couple of years”…they’ll be fine for a couple of months. You have to accept that you either keep these people trained or just fall behind. In our case we’ve fallen behind. So, a resounding no.

*Do you agree with the statement that too much time elapses between requests for and the provision of IT services?*

Yeah, much too much. The life cycle’s much too long, although that could be foreshortened enormously if we could talk to a centre of excellence. In my experience, we probably spend about 3 times as long trying to understand what they want and tinkering at the other end because it wasn’t what they wanted than we do actually building the thing. Combine that with the fact that our procurement department are poor, and we spend so long procuring things, it just is ridiculous. The Property system took us 2 years to implement – 3 months to write it, 9 months for the procurement company to do a deal with the company, and about a year of messing about with what they actually
wanted. That’s 3 months to build the thing out of 2 years. With a centre of excellence, a
decent procurement function, we could have built the whole lot in 6 months.

*Do the customers receive sufficient training to effectively use the systems?*

It depends upon the type of system. Generally speaking, in my view they get the balance
wrong. We’re ok at doing the up-front training but sometimes we do too much training on
a system they’ve never seen before and may not see again for several weeks. I believe
that you should do about 70% of the training after the system has gone live and 30% up-
front. We tend to put in 99% up-front and then the 1% when they realise they can’t use it
properly. By that time they’ve use the training budget. So we get the balance wrong.
The amount of money is probably ok. The balance is to give the person just enough up-
front training to get going, do a few simple things then start to ask questions, then you
provide the one-to-one or workgroup sessions to get them through that stage, when they
actually know and understand what questions to ask.

*Building on that, do the customers receive sufficient training to understand and use the
outputs from the systems?*

Not really, no. They don’t understand what information management is – what to do
with the information being presented to them. That’s something that comes with
experience and use and may take years to get everyone up to that level.

*Do the users receive sufficient training to understand and capitalise upon the job effects
of the introduction of new technology?*

No, definitely not. Its culture really. It’s more to do with psychology rather than
technology. We’re not very good at selling the culture bit.
Do you feel that the systems in place are sufficiently flexible to adapt to ???’s operating and trading environment?

I don’t think they change very much. I don’t think ???’s operating environment changes as much as people would have you believe. We like to tell everybody that we’re different from everybody else. Each department will tell you they’re different from everywhere else. We’re very diverse, but not very different. So we tend to destroy applications to make them look the way we want them to look instead of standing back and asking if we’re really that different. We then take out some of the inherent flexibility that probably does exist and then that makes it difficult when we do want to change. So the answer is probably yes, but we cock it up for ourselves. I don’t the business is that unstable. If you look at it now and 5 years ago, some of the emphasis has changes, some of the values have changed, but the way we go about things is largely the same. How much can it change? We’re a regulated business. There’s a limit to what we can actually change. We’ve got the airlines that are all powerful in terms of what they will let us do. We’re doing things better but pretty much the same.

To what extent do you think that the information systems within ??? capitalise upon the knowledge capital or organisational memory of ????

Not al all. We have a few systems such as the property system where people know how to use the information and do. We’ve got others such as retail where they are trying to use the system to understand the shape of the business, trading patterns, people patterns if you like. But I think we’re just scraping the surface. Knowledge management is something that people are just beginning to talk about in this company. Again it’s one of
those things that the top 70 managers will have in their buzzword list an probably about 7 will read up what it means.

When assessing the success of a new system, how would you rank the following factors in terms of importance?

Me personally, or this company?

Start with the company.

ROI, cost reduction, increased operating efficiency, user satisfaction and usability together, strategic fit last.

From a personal point of view, strategic fit, ROI, increased operating efficiency, systems usability – if users can’t use the system – no matter how good it is – then cost reduction.

Users satisfaction I think is inherent in all, those things. You could argue that that should go first. We’ve got quite a few systems where the users are happy and I don’t know why. They’re happy because it hasn’t changed their job particularly, it doesn’t give them any trouble – I’m not sure that’s a good thing or not.

Would you agree with the statement that ???’s investments in IT always achieve the objectives set for them?

No.

What percentage would you say fail to meet the objectives?

Where the objectives are sensible…90%. Mainly because we start to compromise on functionality and the effect on the business. If you take project Enterprise, the procurement people were keen and wanted to get involved until they realised that the new
systems would mean the number of procurement people being cut from 150 to about 5. Then surprise, surprise they weren’t so keen on it, tried to back off and say no it doesn’t really work. Then we modify the objectives to keep people on board. The reason I say this is that it may well meet the objectives we come up with at the end, but we tamper with them and compromise them to make them fit. But if you’re asking how many fail to meet the up front business objectives I would say about 90%.

To what extent have the systems within ??? successfully included consideration of the following issues?

Firstly their contribution to business goals and needs.

Most of what we do in IT is born out of fear. We need to do something to keep the business moving along and people think that IT is the answer. We’ve got a good IT Director who comes up with ideas that frighten the board like customers using the Internet to but duty-free and they won’t need you any more. They then decide to get into that market, being driven by fear rather than by anything else.

Their impact upon organisational structures and processes.

Until Enterprise I would have said none whatsoever. In the past, even when we’ve tried we’ve generally failed. Going back to the Property system, that should have meant a major change in the property organisation. There are 1 or 2 changes filtering through now, but nothing like what I was expecting. Enterprise will completely change the way we are – in those areas anyway – the processes and the way the business is organised.

Their impact upon work organisation and job design.

Same thing.
Their usability.

Increasingly so. Otherwise people don’t use it. You end up with a large training bill and a huge disaster on your hands..

Their impact upon H&S.

Pretty limited. We are messing around with disabled systems. We’ve got some bits and pieces now, but not a lot.

Their ergonomic aspects.

A bit out of my field. But I would say virtually none.

Their impact upon training and skills.

Not enough really. If you give somebody a solution and its got a benefit of X pounds in terms of productivity. The business will say “lets have that”. If you then ask them to trade off 10% against training some of their staff, they are never willing to go the whole way. It then tends to be the case that after time they realise they are not getting the full benefit and wonder why, specially as we back off and change the focus of ownership.

We've had a few that have reactively dealt with that.

Would you say that the systems in place offer good value for money.?  

Generally not. The cost of some of the systems we've had to put in and the cost of some of them we've had to abort is very high. The problem is we don’t recognise soon enough when to pull out and abort. We need to be able to cut our losses and stop. In my experience you spend 2 or 3 time as much attempting to rescue it when it’s obviously a dead duck. So not as good value as they should be, because it all adds to the cost of the
IT bill. Each failure adds to the cost of a success. For example the support costs are grossly over the top for what people get. But at the end of the day if these old systems fell over, the business would grind to a halt. We don’t land planes, have air traffic control, have landing light system, what we do have is IT systems that the business cannot run without. The business does not appreciate that IT is very expensive. It may not be as sexy as other areas of the business, but it is just as crucial.
Interview 2

What is your normal role?

My current role is called business architect, but I'm currently managing what is called the Release Team. So this is the continuing process work to support Project Enterprise. Ultimately to the point where we start to implement. So, working down here at the moment I have a team of people from ??? and from Oracle, covering all support areas of the business. My particular area of expertise is HR, and I'm business Architect for the people management process that we've actually designed here. So it's a kind of multifaceted role. Of course my day job is managing the release team to make sure that we complete the deliverables on time, and that will take me up until November.

Is the use of IT based Info Systems an integral part of your job, or the jobs of those who work for you?

Yes.

As far as you are aware, does ??? have a business strategy?

Yes.

Are you familiar with its contents and how it relates to you in your role?

In general terms I suppose yes. It depends on what you mean by business strategy. We have a mission statement and we have a corporate strategy department, and we produce a strategy. So, overall yes, and I have a broad view of what part I'm playing in delivering that strategy.
Does the cascade process of mission statement/unit/business strategy/departmental targets take place?

It’s slightly different here because we have a vision for the project. We don’t have an Enterprise mission statement for us as a team here, but we have a clear vision for Enterprise which was agreed with the business to which we are working.

To the best of your understanding, does ??? have a strategy that guides the development of its IT based information systems?

I believe it does.

To what extent do you think that those who develop the IT systems within ??? appreciate and understand the needs of the business?

I suspect that historically, they haven’t. I think that what we’re doing here is very much focused on a business understanding of what the systems will deliver when we implement them. But I haven’t had any direct involvement until this project, so I’m only going on my perception – which is that they don’t always understand the business needs.

Does Project Enterprise cover all aspects of the business?

It’s all the support functions – HR, finance, projects procurement etc – what might be called back of house. Not operational systems, although everything we’re doing will touch every employee in the business.

Do you see it being extended?

There is a sister project which has been kicked off fairly recently to look at the operational side, which is being driven at the moment from Heathrow.
It sounds to me as though Enterprise is as much a cultural change.....

Yes it is. It’s 3 pronged – processes, people, and technology. Although we sit in the IT department, this is a significant change management project and cultural change project.

So where has this come from – where is the driver for Project Enterprise?

It’s come from a number of sources. When -------- joined the organisation, he was aware that many of the systems were not working. Similarly, we had a freedom to manage programme which was a significant cultural change programme, which originated in Terminal 3 at Heathrow, and when they did their work, they discovered that many of our processes were broken, and that was inhibiting them as an operationally focused business unit from doing some of the things they wanted to do. So that was one of the key drivers where we are in processes and systems.

To what extent would you agree with the statement that the process of change within ??? is driven primarily by developments in the technology itself rather than by the needs of the business?

I suspect that it is the technology that drives – or has done. It is a perception, there’s no hard evidence for that.

Have you been involved in the development of IT based information systems within ???.

Not up until now.

Do you feel that you are sufficiently equipped to deal with the role being asked of you?

Probably not. I’m of the generation and age that IT has come late in life, and I’ve struggled at even the very basic level. Because of the way were trying to operate this
project, I don’t feel that I’m adequately trained to get the best out of the technology and if you look at it at a more global level, in terms of the systems were putting in, I’m probably in no worse position than anyone else because nobody else knows the Oracle systems. So in terms of day-to-day operation of the technology, I don’t feel equipped.

In the development of a system, if a conflict were to occur between project managers and the customers, whose views would usually prevail?

I think that traditionally the project managers’ views would prevail, but that’s a gut feeling.

Do you make a point of keeping up to date with business opportunities and difficulties arising from developments in new technology?

Not as much as I should. I realise that there are huge gaps in my knowledge of loads of things like Internet/Intranet. I don’t do as much as I could to keep up to date.

Do you tend to rely on the IT professionals to provide that knowledge?

Yes.

Do you believe that the customers should do more to keep you up to date?

Yes I do. I think there is a lack of co-ordination. I know there is something going on with Internet/Intranet – now it is as much my responsibility to go out and find that information – but I think that there isn’t an acknowledgement that there may be quite a lot of people out there like me who have never had to get involved. I think that there is a kind of assumption that we all understand these things. It’s a bit like finance, it’s very difficult, but as you move up the organisation, to actually say – I don’t understand; I
don’t know – isn’t really on. It’s like budgets, we never train our managers on budgets, we just assume that by the time you reach a certain position in the organisation, by osmosis you will understand how to manage a 2 million pound budget. To me that’s a big training gap.

*So it’s mostly a staff development issue?*

Yes.

*Do you believe that in general most managers within ??? are technically naïve when it comes to IT?*

Yes. Although to say most managers would be a bit of a sweeping statement. We have a lot of technical managers who have to keep up to date. I would say there are a significant number of managers who are technically naïve.

*How might that naivety be addressed?*

It’s about training and communication. It’s about a recognition that time should be put aside to do this. So in other words, it shouldn’t just be something that you pick up along the way. There should be time devoted to bring people up to speed, even at quite senior levels. It should be acceptable to say that I’m spending half a day up-skilling on my IT understanding. We started to do that with desktop. We were all encouraged to go off and get up to speed. So I think that there should be an acknowledgement that time put aside is time well spent – rather than just saying that I’m doing my day job and if I’ve got 5 minutes at the end of the day I’ll link up with someone to explain something to me.

*Do you think that it’s partly because IT is so compartmentalised – IT is the realm of the IT specialist?*
Yes. Totally. I'm actually a member of the IT department and I was quite staggered when I joined the department that there’s no recognition that there is a different animal sitting actually in the IT department. There aren’t many of us, but all of us here are technically members of the IT department and I’ve got procurement specialists, project management specialists....we are part of the IT fraternity and I think that it would help the department to acknowledge that this is going to be a growing trend. Now I'm probably fairly unusual in that what I know about IT can be written on the back of a postage stamp, but nonetheless I think it would help the department to understand that on a project like this, if we remain part of IT then we need to have a closer relationship so that it isn't so compartmentalised – it’s more integrated into the business.

Do you see ??? as an integrated or fragmented organisation?

Fragmented. At the moment.

So do you see that changing?

Hopefully, yes. In my view, what happened was, when we were privatised each unit was encouraged to do their own thing –to diversify – to go off as individual airports and do whatever we wanted and introduce an element of competition. I think we've realised how wasteful some of that was, and what we’re now doing is sharing the benefits of common practice without the dis-benefits of calling it centralisation. It doesn’t mean that everybody has to do everything the same. For example, in this project, unless we get consistency among the processes we’re gaining water. If people revert to old processes and old systems and old ways of doing things then I can buy something separate,
something different, I don’t have to follow the line of Enterprise – I can continue to be in my own little world.

So how will Enterprise change that? If you’ve had a situation over the years where every part of the business has been able to buy its systems from wherever they choose ..........

To a certain extent they will always be able to do that unless someone says they can’t. But what I’m hoping is that the product that we eventually be able to offer will be such that both the processes and the systems will be such that people will want to have it and therefore that will ensure consistency.

So is it just as important as a sales and marketing job?

Definitely. It’s part of the culture change. We’ve been encouraged to do our own thing, to do it cheaper, quicker, better – go off and do it – even though that might not be mindful of the common good. And also we’ve had people reinventing the same thing at different locations – and that’s wasteful.

If people can’t see a positive benefit to them ........

They won’t use it. They’ll go off and do their own thing. It’s an uphill struggle, and there will be local reasons why things are done differently but I’m sure we have wasted money, wasted resource striving to do things differently. We won’t ever go back to the days of everything being done from the centre – those days have gone, but I think we’ll share the benefits much more of common practice.

To what extent do the systems within ??? match the original requirements?
My impression is that we try very hard, but we customised and so on, so yes we have met business needs, but we’ve suffered as a result because we’ve got incredibly complex systems that perhaps only one or two people in the organisation understand, one of whom is the contractor. Now, that can’t really be good business, because the customer is very demanding and I suppose that we have to educate the customers. So yes, we’ve got exactly the systems we need because we’ve customised them so much.

Is it a case of failing to manage people’s expectations?

This project is a classic, that there is a danger that people will want whistles and bells and if we don’t deliver whistles and bells without explaining why, or redesigning the process because we’ve said we don’t want to customise – and people don’t understand the reasons why, then we’ll get the same thing again. So I think it’s a lot about managing expectations.

I have heard a number of grumbles about project Desktop. Do problems there come down to the management of expectations?

Probably. I really didn’t have any.

Would you say that the systems you use are integral to your role as a manager?

At the very basic level, yes. I couldn’t operate now without systems such as Desktop. I’m a traditional manager, I’ve had a secretary in the past who did everything. I don’t have that luxury any more, so I couldn’t do my job without those sort of backup systems. I suspect that if I ultimately go back into the HR community then I couldn’t manage the HR department without the appropriate systems.

To what extent are the systems that you use troublesome to you?
I'm not sure that it is the systems that are troublesome to me, I think it's my lack of understanding and lack of training. The major frustration I've had is, is that there is an assumption that if you are female you can type and you know how to format letters. I have never learned to type, I've never been a secretary, I have no desire to be a secretary. Again, the remedy is in my own hands, I could go off and do a keyboard skills course, but I'm not going to waste my time formatting letters.

That's an important aspect of managing change. The introduction of new technology has meant a change to the way you work, and I would suggest that that change could have been managed better.

When I came here, I said that I wasn't computer literate, and they said it wouldn't matter -- actually it does matter and it is a cause of frustration. This is not just my experience. I know people of a similar age and background who are behind even me in their understanding, and that's caused major problems because they can't input to documents, and everything we do here is held electronically.

Do you think it's because the people who put you in this position are computer literate, and they just assume that everyone's the same?

There's a huge assumption that if you don't know, you'll find out very quickly, but with technology, because it's changing all the time, I don't think you can make that assumption. I would sense that there are a significant number like this.

Would you agree with the statement, that by using the systems you could do your job better?

Yes. Definitely.
Would you say that the systems you use are friendly and easy to use?

By and large yes. My problem is not using it, but understanding what to do in the first place. Looking specifically at the HR systems, the answer would be no, not easy at all. It is a frustration to me that there isn’t an idiots guide to the office systems I use. I find, for the most part, the manuals totally illegible.

Which brings me on to my next question about the quality of documentation provided to you, the user.

Not very good. When I started doing all this stuff, you either knew or you didn’t. If I scrabbled around and asked someone who had been on a training course and had a manual then that was ok, but there is not a set of standard documentation that they give to people.

How would you describe the relationship between the IT staff and their customers?

I’ve always considered them to be remote and not always easy to understand. In terms they might be specialist, they might very well be contract, they’ll be very focused on what they are doing and sometimes find it difficult to put things in layman’s terms. I’m finding that with the technical people here. It’s very difficult to get them to put in words of one syllable what they’re doing. They can't perceive of somebody without their level of knowledge. When I first came here they spoke of “shared drives” but I didn’t share my driveway with anybody! I was actually at that level of naivety. I'm probably as guilty from an HR perspective, some of the language we use is equally as inaccessible. In there has been this traditional image of IT as being a lot of consultants, a lot of specialists, haven't got a clue what they’re doing, don’t really know what their
contribution is. It’s a bit unfair, as there isn’t always a reason to find out unless they’re directly affecting you in a project.

*Are you confident that the IT staff have the skills and knowledge to cope with the demands being placed upon them?*

Here, yes because we’re working with Oracle and they appear to me to be very professional, so I’m confident that the people working on this project know what they’re talking about. That’s a very subjective view. They may turn out to be complete idiots, but I don’t get that impression.

*Would you say that you’ve received sufficient training to operate the systems you use?*

No.

*Have you received sufficient training to use and understand the outputs from the systems?*

That doesn’t really affect me too much.

*Would you say that you’ve received sufficient training to understand and capitalise upon the job effects of the introduction of new technology?*

Probably not. I’m sure that there are things that I could be doing, using the limited kit that I’ve got, that I’m not aware of. I discover every week simple little administrative things that make life easier. But these things are discovered purely by chance.

*So did you receive any formal training?*

Only for Desktop. To a certain extent there was no compulsion in that, so it was a question of making yourself go and giving yourself the time. I only had time to do the
very basic level and some bits of it that would have been very useful I didn’t have time to do.

So the person driving the training was you, not the company.

Yes.

On a scale of 1-10, stable-unstable, where would you place ???s operating environment?

Although we’re a business that’s constantly changing, I would say that we work in a reasonably stable environment – about a 4. The fundamentals of what we do doesn’t change significantly.

When assessing the success of a new systems how would you rank the following factors.....?

Increased operating efficiency, cost reduction, system usability, user satisfaction, ROI, strategic fit.

Would you agree with the statement that ???s investments in new technology always achieve the objectives set for them?

No.

What percentage would you estimate fail to meet the objectives set for them?

Maybe 50% - but this is very much a guess.

To what extent do systems within ??? successfully include consideration of the following issues?

Their contribution to business goals and needs.
I think that traditionally we haven't done very well. I hope that with Enterprise we are doing better. We don't know yet.

*Their impact upon organisational structures and processes.*

I don’t think that traditionally we have taken into account enough of that. It’s a major part of what we’re doing here now.

*Their impact upon work organisation and job design.*

Well here it’s absolutely fundamental. We can't do Enterprise without considering that.

*Their usability.*

Again traditionally we haven't focused sufficiently upon that. With Enterprise it’s a fundamental part.

*Their impact upon H&S.*

I don’t think we’ve given that much thought. We have in areas where its obvious, but for the most part it hasn’t been uppermost in our minds.

*Their ergonomic aspects.*

Again I don’t think we take sufficient notice of that.

*Their impact upon training and skills.*

I think that there has been some recognition of that. With us here, it’s absolutely fundamental. We will affect peoples skill sets anyway. There will be a significant impact upon how we train and what we need to train them in, but I think that traditionally that has not been sufficiently recognised.
Would you say that the systems within ??? represent good value for money?

I suspect that they haven't in the past.
Interview 3

*What is your normal role within ???*

I’m the Finance Director.

*What does this normally involve?*

A vast range of things. I’m responsible for the financial well-being of the company. I ensure that we are properly recording all financial transactions. That we are providing accurate and prompt management information to the business. Alerting management and directors of any issues arising for corrective action. Trying to control expenditure, drive up revenue and all the rest of the profit generating activities.

*Is the use of IT based information systems an integral part of your job or the jobs of those who work for you?*

Absolutely.

*As far as you are aware, does ??? have a business strategy?*

We certainly have mission statements and are certainly developing strategies for each airport, looking forward and building 10-year plans, both revenue and capital. We have that sort of strategy. Within each of the business functions, for example retail, they will have strategies – it’s all part of matrix management – that fall back into the main business. So everything cascades down from the mission statement.

*To the best of your understanding, does ??? have a strategy that guides the development of its IT based information systems?*
IT clearly is referred to in the mission statement at the highest level. I believe that there is a strategy, but I’m not clear as to what that strategy totally is in all cases. I’m aware of the Enterprise strategy because that is affecting finance processes. But -------- wider strategy for IT is, one doesn’t have the full detail of that.

*To what extent do you think that those who develop the IT systems appreciate and understand the needs of the business?*

Very, very patchy. Some things that have been rolled out have been quite good other things have appeared without a great deal of consultation. You are aware that there are certain projects being worked up, but you don’t get to hear about them until some way down the line.

*Even though they might concern you?*

Perhaps not concern, but have an interest in. Enterprise, big project, that clearly concerns me – I’ve been involved with from a very early stage. But there has been a major review of operational systems that seems to have been very secret squirrel. It suddenly comes out the woodwork that someone’s got a project for potentially 14 years and the FD is only just beginning to understand what the potential of it is. That’s a problem that there doesn’t seem to have been a business owner and it is certainly not clear at the moment as to what the benefits of the business are.

*To what extent would you agree with the statement that the process of change within ??? is primarily driven by developments in the technology rather than by the needs of the business?*
Again it’s patchy. There clearly is a need, in some cases for technology to change.

Desktop was one example where we had a whole load of old systems that didn’t work terribly well together, so desktop replaced these systems. Enterprise is a combination of technology and business need. I think generally most big projects are driven by business need.

*Have you been involved in the development of IT based information systems?*

I’ve been involved in project boards and so on.

*From inception through to implementation – in an advisory role?*

Some systems, such as retail where there is a strong financial element I will be involved from inception, others will be brought in more in an advisory role.

*Do you feel that you were sufficiently equipped to fulfil the role asked of you?*

In many cases no. I was thrust the job of chairman of the rollout of the Desktop at Gatwick. I’m not a tekkie, I’m not particularly strong IT-wise and to be honest I don’t have a huge interest other than wanting the damn thing to work. There is a danger that we do take people out of the business and try and put them in to inappropriate roles when it comes to IT, the danger being that we don’t really understand what we are doing.

*Do you think that your knowledge and skills could have been used more effectively?*

I think if there is a proper explanation of what some of this stuff means. You tend to get presented a load of information which is very unclear. What is needed is for someone to say “what this means is...the implication of this decision is this...”. And what tends to happen is that you tend to start talking about all sorts of technical things which one is not
qualified to comment on at all, unless somebody explains in layman’s terms the implication of the decision we are being asked to make.

Do you think that part of the problem is that the technical people you are dealing with don’t understand the business that you’re in and that there’s a middle ground that nobody quite sits in?

I think that there is an assumption that people understand certain things about computers and systems which maybe they don’t.

If a conflict occurred between the project managers and the customers, whose views would normally prevail?

If it’s a technical conflict, then I would expect the IT side to prevail, because those are the experts. I think if it was a business conflict, I would expect the business to prevail. They might not do, but I would expect them to.

Do you feel that you have had an influence on the development of the systems you use?

Yes, I think so on some of them, not all, but some. Certainly on Enterprise we are getting heavily involved.

Do you feel that you own the systems you use?

Not personally. I do not feel that I am the personal owner of the financial systems. They are used by the group and there is a user group and a chairman of the user group. I would look to them to be the owner of the systems.

But it is the business side that owns the systems rather than the IT side?

Oh yes.
Do you make a point of keeping up-to-date with business opportunities and difficulties arising from developments in new technology?

To be honest, no. I clearly keep an eye on what’s happening in our own systems, but the wider span of things, I don’t actually sit down and read computer magazines and identify all the wonderful gizmos that are coming out on the market. I expect somebody else to be doing that and coming and telling us “here is a wonderful bit of software and we believe you can use this in your business because it has these sorts of capabilities that match your business needs”. I’m not too sure we fulfil that role particularly well.

Do you believe that in general most managers within ??? are technically naïve when it comes to IT?

Yes.

Do you think ??? should and could address this?

I think that they probably should to a certain extent. You don’t want everybody being technical experts – all you need is people who understand that there are systems and things that are available that will help them. Perhaps as part of the Growing the Business course there needs to be some pretty basic IT training given some appreciation, and perhaps every year an update given as to how technology is changing and these are the sorts of new systems available. We certainly aren’t good at that. I was talking to someone this morning who works for Thorn whose engineers use hand-held computers to record work in progress. I’m not aware that we use them extensively yet in our business.

Do you see ??? as an integrated or a fragmented organisation?
Business-wise we are reasonably integrated. There is some fragmentation of the non-airports areas, but then one would expect that. We are a matrix management company which does bring up some interesting conflicts of function versus line and I believe there is a degree of diffusion sometimes in those areas.

*Do information systems within ??? support this integration?*

It depends which system you are thinking about. The systems we have, in many cases, are very dated and they certainly don’t talk to one another, so the systems themselves are fragmented. I think that is the systems are fragmented, we don’t get the degree of common ownership of the processes that you need to make the systems as effective as possible. Clearly Enterprise is seeking to address this issue. We've got a time and attendance system that was never designed to talk to the payroll systems. We've got people walking around with security cards with automatic swipe functions on them, but we don’t use them to capture time and attendance data. We could save a huge amount of money by doing that, yet here we are bringing in Enterprise systems that are actually going to change the payroll system and pay processes, but time and attendance was not originally included in that and clearly we aren’t going down the road of understanding of swiping and controlling work. There is a danger that again we will look at part of the process and not understand the full process.

*To what extent do the systems that you use match the original requirements?*

That’s hard to say, as many of the systems were installed before my time. Many of them are donkeys years old.

*To what extent could you get along without using the systems?*
It would be very difficult. Productivity of the company has been built based around the systems. If the box goes down I've got big problems.

*To what extent do the systems provide information that seems to be just about exactly what you need?*

The financial systems we have are archaic and we make the best use we can of them.

*Would you agree with the statement that by using these systems I can do my job better?*

If I had easier and more user-friendly systems I could do my job better. I would waste less time. There is a lot of manual intervention required. The very fact that the financial package does not have its own reporting system is a real issue. It's good at recording the transactions – general ledger is in principle very simple – but it's very difficult to get the information out, which is why we are addressing it through Enterprise.

*How would you describe the relationship between the IT staff and their customers?*

I don't think that the IT staff are close enough to the business user. They tend to have a technical mystique about them.

*Are you confident that the IT staff have the skills and knowledge to cope with the demands being placed upon them?*

Not in all cases. I think they do a pretty good job. On some occasions when things go wrong, you think “what the hells happening now?” and you wonder if you have the right people with the right abilities.

*Do you agree with the statement that too much time elapses between requests for and provision of IT services?*
Not particularly. I haven’t had any particular experience of problems. Maybe we don’t have enough proactive IT in the business.

*Do you think that the systems in place are sufficiently flexible to adapt to changes in ???’s operating and trading environment?*

The financial systems most certainly are not.

*Is Enterprise addressing all your information requirements?*

No, it doesn’t deal with the front-end processes, so whilst it might change the invoicing system, it doesn’t necessarily change the way you capture the data and some of the key problems we have are capturing the data out of the business and getting it into the system and it’s not addressing that part of the process. So, whilst it may produce a splendid invoice, inputting it into general ledger and the right cost codes, it’s not actually getting a fully integrated process.

*Is that because it was just too big a task?*

Yes.

*Do you see this problem of data capture as being a major constraint to Enterprise?*

I think that when we get the new systems we’ll begin to see just what a serious constraint it is. I think the new systems will expose that.

*On a scale of 1-10...................*

About a 4. We’re more stable than unstable.

*When assessing the success of a new system.....................*
Increased operating efficiency, ROI, cost reduction, user satisfaction, usability, strategic fit.

Would you agree with the statement that systems within ??? always meet the objectives set for them?

I wouldn’t – I don’t think the objectives are properly set. I don’t think we start off with a clear idea of what we are trying to achieve.

To what extent.....clearly consider the following issues?

Business goals and needs.

If you take desktop, they were successful in getting there.

Organisational structures and processes.

We don’t handle that at all.

What do you think about Enterprise in that respect?

I’m not convinced that we have got to grips with the big change issues. I’ve got a nasty feeling they are using people from the business who have been operating the existing systems for so long that we’ll end up redesigning what we’ve got. That really worries me. That’s a fundamental problem that we could be walking in to. I've yet to find real radical blue sky stuff. I don’t yet see £4m annual benefit from it – that’s the depreciation charge – if we’re not careful, we’re not going to get it right.

Work organisation and job design.

I don’t think they sit down and think that this is not just an IT project, it’s about how we work and the way we work, and IT’s a supporting solution. We tend to see IT as a be-all-
and-end-all. IT supports the function and the process. We are terrible at exploiting IT. We work out how it can perform a particular job rather than identifying its full potential.

Usability

Desktops ok. I’ve still got a problem in that I don’t fully understand Windows. Generally it’s a usable system. The accounting systems are just not user-friendly. They are so old – nearly 15 years out-of-date – they’re not good. If you’re a frequent user of it, you can get lots of information out of the BOSS database, but sometimes it quite hard to navigate your way around.

H&S

Things are improving.

Ergonomics

Every time you get your PC moved around, you get another workstation inspection and we end up buying some more desks. We do consider it, but I’m not convinced that when we use operational systems we get it quite right. One problem was that systems were installed into rooms that were not properly ventilated. ending up with temperatures twice what they should be.

Training and skills.

Clearly, when you install a new system, you need to start training people. I’m not certain that we do that terribly effectively. We probably need some better support after about 3 months, when you’re comfortable with the system and have identified questions and areas where you need support. I’m not sure that support is there at present.
Interview 4

What is your normal role?

My title is Head of Corporate Systems which means that I am responsible for the systems that support the corporate functions – finance, procurement, personnel. I have a second part of the job, which is actually bigger, which is Programme Manager of the Enterprise Project which is the replacement of the corporate systems, a process re-engineering job and an organisational change job. I sit astride both IT and the business. I consider myself an IT professional, but I typically work with the business.

As far as you are aware, does ??? have a business strategy?

It would be glib to say no, but sometimes it doesn’t look like it.

Are you familiar with its contents and how they relate to you in your role?

At times. Its certainly not a publicised strategy, it’s not clear.

To the best of your knowledge, does ??? have a strategy that guides the development of its IT based information systems?

No.

To what extent do you believe that the people who develop the IT systems appreciate and understand the needs of the business?

Minimally. I think its compartmentalisation. I think we have a very small IT function, so a lot of what we do is done by other people for us. Because we don’t have a clear strategy it’s difficult to tell where any peg fits, so what happens is that very often a force
of personality will drive something through and will end up sitting alone rather than being integrated into the business.

*Where does that force normally come from, does it come from within IT or from within the business itself?*

It’s a 2-way street. I think that companies get the IT they deserve and there is a lovely quote from within that says that “we consider IT to be more important than landscaping – but only just” and my experience would hold that to be true, but it is changing.

*Where’s that change coming from?*

From a few key directors.

*I understand that there are moves afoot to develop an IT strategy. Could it be the people involved in this that are providing a force for change?*

Perhaps, but I firmly believe that the IT strategy comes from the business strategy, and as this is unclear……..

*To what extent would you agree with the statement that the process of change within is primarily driven by developments in the technology rather than by the needs of the business?*

I don’t think the process of change is driven in . There may be the business strategy to get out of airports or stay in airports – I really don’t know, it looks like we’re forming into a conglomerate and that could be the corporate strategy – it looks like it is – but it’s never officially or explicitly stated. I think that we’re quite a reactive business. We’re
very operationally focussed, and what that means is that the managers we develop are
devices — or responsive to take a more positive note. We’re good at 15 years, and
we’re good at now. We’re not good at what’s in-between. In terms of the process of
change being driven either way, I think we have a few pockets of technologists who come
up with solutions looking for problems. I don’t think we concentrate enough on solving
the problems with technology. There’s a mismatch between business needs and
solutions.

To what extent have the customers been involved in the development of IT based
information systems?

It depends upon which area and which application you are talking about. If you look at
Enterprise, the team is built up entirely of business people, there are no ?? IT people on
the project.

How are they involved, from start to end?

From start to end – on Enterprise.

What’s your impression of the other parts of the business?

It varies enormously, from areas where there is no customer involvement where we have
the da-dah! syndrome where the customer is presented with the surprise system, to
project Enterprise with full involvement.

Where customers have been involved, do you feel that they have been sufficiently
equipped to fill the role asked of them?

Not a chance. They are in the dark ages.
In what way?

In terms of general technical awareness, they are in the dark ages. It’s not true of everyone. There are some out there who have great vision. But when it comes to almost pulling a punter off the street, they are not used to the rigour that is required in terms of project management. They have no experience of the disciplines, of the fact that computer systems are stupid. We struggle as a group, as we effectively like the invisibility that the muddle gives us. So all the disciplines that are behind an IT development come from the fact that IT is stupid, it has no intelligence that you don’t give it. They just struggle massively and that ranges from some fairly senior people to the average Joe

So, is there anything that can be done about this, or is it just the nature of the beast?

I think that the nature of the beast will change. We have put a large number of people through Enterprise and they have left with a far greater understanding of what can be done and what must be done to make it work. So it will change, and those people may be financial controllers now, but at some point in the future will be financial directors. I think it’s evolutionary, I don’t think you can throw a switch and say there you go.

Do you feel that the IT customers understand the needs of the business?

No, I don’t think they do. We’ve gone from a civil authority to a business. There are people who have made quantum leaps and who are now awesome corporate players that you can put in anywhere at any level, and there’s a huge wadge of people who still think we’re the British Airports Authority. I think they understand a number of the needs of the business, customer service being an obvious one, but we only do customer service to
make a profit – there’s no inherent goodness in doing customer service. There is this ethos that you provide customer service because the customer is king. No, it’s done because they will come back again and buy more from you, so it’s not customer service at any cost. We’re quite good at safety – it’s core to our business. What we’re lacking as a business is the profit motive.

Do you find that they know the need of their part of the business – do they lack the bigger picture?

We are a functionally oriented business, so when they are put in the function, they typically understand what goes on. We’re not very good at understanding – internal customer service is very poor, which indicates that person X really does not understand the needs of person Y. So there is an element of sub-optimality, but there’s also a view that says...I don’t really control the profit...so that’s what I mean by both sides. My background is financial services, and there, if you had a branch manager, he knew exactly that he was responsible for the profitability of that branch, even if finance came in and did the audits and verified the plan, he or she knew they were accountable for the profit. I think that that is where we sometimes loose it.

Do you think that where customers are involved in the development of IT systems, they are considered to be a valued member of the team?

Well they are here.

If a conflict occurred between project manager and customer, whose views would normally prevail?
It depends, there’s no one answer. We try to adopt a policy here whereby nobody’s views prevailed, but the business case drives it. So, if a customer says that they have an additional requirement, our start point is that it’s not in the scope so we’re not doing it, but if you can convince us that there is a valid business reason to do it, then we’ll do it.

Do you feel that users have had a positive influence on systems development?

Yes.

Who do you feel owns the systems within ????

Nobody. That’s a huge problem. The reason is a combination of things. There is a lack of service delivery by IT which ends up with customers disowning them. They’ll use it because they have to. There have been huge shake-ups in the IT function over the past 5 years and it has resulted in individuals who once had a sense of ownership, no longer having much confidence.

Do you make a point of keeping up-to-date with business opportunities and difficulties arising from developments in new technology?

Yes.

Do you think that ??? could do more to help?

I think they should do less rather than more. I think we should walk before we run. Let's consolidate where we are then get on with the rest. We’re quite a small function and we’re very overstretched. The developments of the new stuff is always more exciting – who wants to do maintenance? Who wants to deliver the service? If you get the service right then everybody ignores you, you get it wrong and you get hammered.
Do you believe that most managers are technically naïve when it comes to IT?

Absolutely.

How does that naivety manifest itself?

Unrealistic expectations. Someone will say...I think we need a document monitoring system, and we start to kick something off and we end up with a workflow system, and they say...its not what we thought and by that time you’ve put a lot of effort in up front. People latch on to buzzwords and these end up as solutions looking for problems.

Do you see ??? as an integrated or fragmented organisation?

Fragmented. And that’s not necessarily a bad thing.

How do you see that fragmentation impacting upon IT developments?

The real issue is that anyone who has a budget can spend it in any way they choose. So, if for example the fire service decided that they wanted a training records system, which you could argue the whole business needed, what would happen is that the fire service would buy a training records system which would exist at a few locations for a few people. We would have a corporate system which would try and do something similar, and personnel would have one, but never the same one. Diversity is king. What that means is that you don’t get any consolidation of information, it’s just too expensive to do it, and you may find that in fact function A is buying from a supplier, function B is buying from a supplier and you could get a lot better price by consolidating the 2.

How can this sub-optimality be overcome? Does it come back to strategy formulation?
I think that first of all it comes from leadership. For it to be effective, you cannot give licence to other people to implement IT systems. As an IT function, you have to have authority as well as accountability. That will be the only thing that changes the way we operate. Until there is teeth whereby the leaders of the company say...this is the way we’re going to do it.

So if the fire service wanted this records system, would they go to the IT department, or would they go to ABC Systems?

They’d go to ABC Systems, who may be a great company – or may not be.

So, you’re saying that the answer is to have a more centralised IT function, where all requests for IT services have to be validated.

I think that that would not have to be centralised, it could be dispersed geographically, but it needs to have teeth. In much the same way as you can only build air sides with the express permission of Heathrow Airport, you can only build technology with the express permission of IT. And the probability of that happening is about zero.

Is there a lack of will, or a lack of appreciation of the problem?

It’s a combination of both of those. We make shed loads of money. If it ain’t broke don’t fix it.

To what degree do the systems in place match the requirements originally set for them?

That’s a very interesting question. I think what we are really bad at is defining requirements. To answer the question is problematic because you can only tick the box that says we met the requirements if you know what the requirements are when you start,
and that’s not generally the way we do things. We’re typically quite woolly with the requirements. It’s a lack of discipline and a lack of rigour – just get it out the door.

How would you describe the documentation provided for users?

Inappropriate is probably the best way of describing it. It varies between someone who spends a lot of time on a user manual that is never opened, to someone saying…here’s your system, I’m off now. I suspect the weak point is actually implementation. Implementation involves a whole raft of things you have to do, and documentation is one of them, and not doing documentation is ok as long as it is a conscious decision. If you’re writing a system for a small number of users who have all been involved in its development, then why would you provide documentation? Most of the developments are outsourced, even the development of Enterprise is outsourced to Oracle, so the documentation varies. Very little development goes on in-house, our role is primarily project and contract management. We don’t manage change well as a company and I think that the documentation and its level of appropriateness is key to managing the change of putting in a new system, and I’ve discovered that if we’re not keen on it then we won’t do it.

Do you think you could do it better if more development took place in-house?

I think we've got to start managing change better as a company, whether we do it in-house or out-house doesn’t really matter. The suppliers will do whatever you want them to do, you’ve just got to be clear as to what that is.

How would you describe the relationship between IT and its customers?
Very good in parts, very bad in other parts. There’s not one statement because we’re not a centralised IT function. I think that there is a fairly uniform view that, taking last year, service was abysmal and that it has improved inordinately over the last 6 months. So those people who deal with IT on a service basis will be getting better.

*What about in the other direction?*

I think again it’s patchy. I think IT is split between people who are very user-friendly and those who are very user-unfriendly.

*Are you confident that the IT staff have the skills and knowledge to cope with the demands being placed upon them?*

I am confident that they don’t.

*What are they lacking – technical skills, management skills, or across the board?*

Across the board. In many ways the function has been left to wither on the vine over a very long period of time. I think that the business doesn’t understand the nature of business infrastructure, which I think IT is part of, and that to fulfil its role it needs to be capable of account management, analysis, and it needs technical skills as well. We don’t really progress the way we should in these areas. It’s a training and recruitment issue, but primarily it comes down to leadership. IT feels very much subservient to the business, which is right, but there comes a point at which you have to say...ok, we are more important than landscaping and therefore we need this investment, and frankly some of the people that we’ve got just aren’t up to it.

*Do you agree with the statement that too much time elapses between the request for and provision of IT services?*
It depends upon the scale of the request. Enterprise is going to take 3 years and the request was probably issued 5 years ago. To get commitment to do that sort of work takes a long time. But equally you can imagine a function saying… I need this application to solve this problem, and I want it delivered in a month.

_Do you think that the naivety of the customers might place unrealistic expectations?_

They just can't understand why you can't do it now. There is a view that we could have done Enterprise off-the-shelf. I've go a picture on my wall by Renee Maigret “This is not a Pipe” – it's a picture of a pipe and it isn't a pipe, and this is key. IT is like the pipe in the picture. It's not the real world, everybody thinks it is. Unless you model it very well it just falls into disuse.

_Do you believe that the customers receive sufficient training to effectively operate the systems?_

No. I think it gets cut, just like everything else at the end of the day. We don't have a dedicated training department, so it gets done as and when resources allow.

_Do you believe that the customers receive sufficient training to effectively use the outputs from the systems?_

The same answer applies.

_Do the users receive sufficient training to understand and capitalise upon the job effects of the introduction of new technology?_

I don't think we've done anything on any sufficiently significant scale to affect this. However, Enterprise is totally about that. One of my subordinates runs a change team
that is specifically about pointing out to the business the implications of the new way of working. We’re getting a lot of senior support. We’ve now go 3 senior executives on the programme. They are putting a significant amount of time into the project which is critical to its success.

*Do you feel that the systems in place are sufficiently flexible to adapt to changes in ???s operating and trading environment?*

No, that’s why we are doing Enterprise.

*On a scale of 1-10..........stable-unstable?*

It depends upon where we are in the business, within the 5-year regulation cycle. It’s never very unstable probably about a 7, with it being a 1 or 2 as we nail everything down prior to re-regulation.

*To what extent do you think that the systems in place within ??? capitalise upon the knowledge capital or organisational memory?*

I don’t think they do. We have something like a 2% staff turnover. When you have that, you have a significant number of people who have been with the company between 15 and 30 years, and if you think of that as corporate memory, there is no system around that could possibly encapsulate that. That’s not to say that we’re not trying to put knowledge into our systems. We’re trying to build corporate memory into it, but we can’t compete with 8,500 people who have been here a long time.

*Even if the systems were in place, there has to be a culture of information exchange for it to work. People have to be motivated to share their knowledge.*
Interview Transcripts

Our culture is one of not sharing information. It’s the single most unhelpful culture I’ve worked in. As a new boy, people will watch you struggle even if they have the answer. If you ask them, they’ll give it to you, but they won’t volunteer it.

*When assessing the success of a new system, how would you rank the following factors.....?*

ROI, increased operating efficiency, user satisfaction, strategic fit, usability, cost reduction.

*Would you agree with the statement that ???'s investments in new technology always meet the objectives set for them?*

No – what objectives?

*What percentage would you say fail to meet the objectives?*

More than half. I’ve been in IT for 20 years and I don’t think it’s changed.

*To what extent do system within ??? successfully include consideration of the following issues?*

Their contribution to business goals and needs.

It’s patchy. There some where the users have been totally involved where it’s 100%. There are others where people would say…why would I pay for that?

*Can I read from that, that you believe user involvement to be critical to this issue?*

They’re the people with the goals.

Their impact upon organisational structures and processes.
We have been really, really bad at it. The Enterprise uses 3 triangles to describe the dimensions of the project and these are people, processes, and technology. The integration of these 3 things is what it is all about. 

*Their impact upon organisation and job design.*

The same applies.

*Usability?*

We focus upon usability as a company and focus upon it too much. An example would be that the aim of the Enterprise software is to be able to integrate the business process, so you can go from placing a contract with a supplier, you then make sure the bills are paid, ledgers updated and then on to management information at the director level. We have other applications that stand alone, but the way that you make it work is to drag and drop something into a shopping basket, and we’ll talk more about whether or not we can have a shopping basket in Enterprise and whether we can get that shopping basket onto the front-end than we will about whether we can get from a framework agreement to management information in 3 steps. We love the bells and whistles.

*Do you think that often those bells and whistles obscure, or are the noise around the information?*

I think that by and large that is the case.

*Their impact upon H&S?*

H&S is a big deal for ???. Nothing happens without H&S issues being addressed.

*Does that also apply to ergonomic aspects of implementation?*
Yes. All H&S guidelines are followed, workstation appraisal etc are all followed.

*Their impact upon training and skills.*

Again I would point to the Enterprise model and say that that is what we’re trying to do. We’ve been a bit patchy in the past.

*Do you consider that IT systems within ??? represent good value for money?*

No.
Interview 4

*What is your normal role?*

Customer Service Director for Heathrow. Each of the 4 Terminal Managers reports through to me as well as the Ground Operations General Manager.

*Is the use of IT-based information systems an integral part of your job or the jobs of those who work for you?*

Yes it is. My job at the moment we are starting to get information on the system now, like the Quality of Service Monitor (QSM), and we’re starting to get information on airlines, whereas before I didn’t use it apart from the diary because there was nothing there …I won’t use anything unless I find it can help – even if it is the thing to do. Now we are starting to get that sort of information, I’m much more interested, because that’s the sort of information I need.

*So it’s executive information/decision support...*

That’s right – what are the trends? What’s happening? And if you’re seeing customers it’s always as well to have the latest information on them, their fleet, the issues and partnerships.

*As far as you are aware, does ??? have a business strategy?*

Yes it does. We talk about we don’t sometimes, but we have a business strategy that I think in our business is what I would call a moving strategy, because it’s the type of business where things change so therefore we have to continually review our strategy. So I think that sometimes people make the mistake by thinking that if we haven’t got a cast-
iron strategy then we haven't got one. We need to be much firmer on the basics of the values and standards of what we stand for as a company, ad I think that that's the bit we haven't got in place yet. I don't mean every single detail, but core values and standards that define what we want to be.

*There are those who advocate a post-modern approach to business strategy by stating that the dynamic and uncertain nature of the environment means that the best strategy is to have no strategy – just equip managers with the skills and tools to be able to anticipate and adapt to changes in the environment.*

I think that there is a bit of truth in that, but I think that you do need this core strategy. I agree that managers have got to learn to be able to manage within a moving environment because that's how it is.

*To the best of your understanding, does ??? have a strategy that guides the development of its IT-based information systems?*

We didn't have. --------- and his team have got a strategy that's linked to Enterprise. I think that again, funnily enough, what we are missing are the standards of how we use it and what we use it for.

*More of an information strategy than a technology strategy?*

That's right. Sometimes things like CC-mail half of what's there is useless and you spend too much time fiddling about with it. We need to have some sort of standard/strategy – whatever you want to call it – and I don't believe there is one. I have resisted using it because I don't want 100 CC-Mails every day. When you start using it, you seem to get everything.
To what extent do you believe that those who develop the IT systems appreciate and understand the business needs?

I think there has been a lot of work to ensure – and this is a 2-way thing – I think the business needs to ensure that IT people understand as well as IT people having to seek-and-find, it’s not a 1-way street. I do have a little bit of concern because we’re going through a lot of change and we need to ensure that we do all understand because there’s some risks otherwise of waste and going the wrong way if we don’t. I don’t believe we do in all cases at the moment, but I think that that is within our remit to put right.

To what extent would you agree that the process of change within ??? is primarily driven by developments in the technology itself, rather than by the needs of the business?

I would say that that used to be the case, now we are listening to real practical business needs and not necessarily going for the next whizzy-bang thing on the market. We’re actually challenging, questioning and making sure that there is a need. I think we’re still learning, but I feel more comfortable.

Have you been involved in the development of IT-based information systems within ???

I have been involved with Enterprise from the start and in airport operational systems it started with a trial that we did where we identified things that were missing and hindered doing our jobs better. We didn’t know how we were going to get it – I’m not an IT person – we spoke to IT people and asked what was out there, what did we need, how can we do this better?
Did you feel that you were sufficiently equipped to fulfil the role asked of you?

Probably not. I wasn’t aware of what you could do, what is out there. I think out IT people sometimes make the assumption that you know more than you do. Even the best and most confident of us don’t want to look foolish, so you may be hesitant.

Do you think that your knowledge and skills could have been used more effectively?

My experience and knowledge have been used quite a lot, so I think it has been.

In developments with which you have been involved, if conflict occurred between project managers and customers, whose views would usually prevail?

Whoever is developing what we need for the business.

How is that arrived at?

Whatever we are trying to achieve, trying to deliver, and what’s practical. Sometimes certain things aren't practical. I would want to make sure those points were covered and we delivered for the business.

Who do you feel owns the systems that you use?

At the moment – and I don’t think this is right – I think somebody else does. As we come into the new airport operations systems, because of the involvement we will get, we’ll feel that we own them. Up until now that isn't the case. Things are changing, we will have had an input into the development and the systems will be of use to us.

Do you make a point of keeping up-to-date with business opportunities and difficulties arising from developments in new technology?

I probably don’t. I probably should. Our IT people do a pretty good job in making sure that we’re aware of these things. I’m probably fed rather than making a point of keeping
up-to-date. I don’t think – and I must be careful not to make assumptions – that things aren’t going to be useful to me, that allow me to do my job easier, quicker, better, I lose interest fairly quickly. That’s a bit naughty. I quite like to be fed by experts and then I seek and find when something triggers me, then I put it to a business challenge and ask for more detailed information.

*Do you believe that in general most managers within ??? are technically naïve when it comes to IT?*

I think a high degree are.

*Do you think ??? can help?*

Yes. This is all part of being fed with the awareness of potential opportunities and then the business sees those opportunities and grasps them.

*It’s a bit of a chicken and egg situation really. If you’ve got an IT department who is not as aware of the business needs as it perhaps should be........*

That’s right, you can loose the opportunity then. In order for the company to get the best out of their people needs to try and drive up the awareness of IT in their managers. But it is this 2-way street, it is also up to the individual to pursue this awareness.

*There is a move within ??? to have people with a foot in both camps. People who have a background in the business, but also have a high awareness of IT, to act as intermediaries.*

Yes, and I think that that is a good move.
Do you see ??? as an integrated or a fragmented organisation?

I think it is integrated in so far as what ??? means and this is where I go back to the fact that we haven't fully clarified that. We know in our heads and our minds what ??? stands for, but we need to clarify it to all our teams. Considering the diversity now in terms of duty free, retail, international operations etc. I think we are very good at linking ourselves – I wouldn’t go so far as to say integrated – we are linking ourselves quite well and perhaps we can go forwards from that.

Do information systems within ??? support that integration?

Not at the moment, no.

So the information systems are fragmented?

Yes. That’s why we are driving to do Enterprise and AOS. If we can do all that then we can motor.

Do the systems that you use enable you to make better decisions?

Me personally at the moment probably not. What I want from the systems I believe will. The things that are coming on now, like information on customers, helps me with strategy or a consultation or negotiation. They’ll enable me to be a little bit sharper and therefore I get a better deal or I have a better meeting and understanding with my customers. That will then in turn lead to better decisions.

Do the systems that you use allow you to define the way the information is extracted and presented?

Yes. The problem is the lack of integration of information and I can't be bothered with going round to all the different systems to find out what I want to know – I haven't got the time to do that. I think that’s what we’re working toward and would be most helpful.
Are you a more effective manager by using these systems?

Again, I think I will be.

Will the systems enable you to be a more innovative manager?

Yes. I think this goes back to the possibilities. If you have got relevant information – relevant, otherwise you are just swamped with information – if you’ve got the latest information and possibilities and opportunities, then that opens up your mind to the things that you can influence.

To what extent do the systems at the moment overload you with more data than you can possibly use?

To a great extent. It’s very important – without being too rigid – that we make sure we know what we are trying to get from these systems. So that we don’t just swamp the place with irrelevancies, and then you can’t find your way through to what you really need. We’ll end up not being cost effective and efficient because we’re wasting people’s time. Some people are quite interested in seeing the irrelevancies, but businesses can’t afford that.

To what extent are the systems troublesome to you?

They’ve settled down nicely. We went through a phase where I didn’t want to play with it any more, but we’ve gone past that now and things are far more reliable.

Are the systems friendly and easy to use?

What I use it for I’m fine with. I haven’t had feedback from others that it’s not.
How would you describe the documentation provided to you?

I'm a real ABC person and sometimes documentation is just not provided for my level. We sometimes try and over-complicate and all the customer wants is step-1, step-2 etc.

How would you describe the relationship between IT staff and their customers?

I've had very good relations because we've grown up together with the business and I've found them very responsive. We've had our frustrations, but everybody's always been trying hard. I think that in the past there has been misunderstandings as to the urgency of response – IT not realising how urgent something is and how much it puts people out – that they are actually facing the external customer and therefore they are the ones who have got the real hassle and it is the support staff who really help that delivery, or not. We are getting better and better at that, but I think we still need to work on it.

Are you confident that the IT staff have the skills and knowledge to cope with the demands being placed upon them?

I don't know, but I would say that we have a load of people who have and are excellent. I wonder with all the pulls of the Year 2000 project, and all the pulls and opportunities that people can go on to other things, whether we will retain that. It's a slight worry as it could put us at risk.

Would you say that you have received sufficient training to effectively operate the systems that you use?

No, but I think that's partly my fault. I haven't taken up all the opportunities. This is a problem in our company – this time thing – and again you should be careful with your priorities as the training could actually save you time. Different people like to learn in different ways. I like to be comfortable with a system before too much training. There's
a chap from security who helps me in his own time, when I need the help. I don’t feel 100% comfortable with classroom things as I’m a bit slow with IT. I like to keep going over things until they get ingrained and I feel as though I’m holding people back. So I would say that there have been opportunities, but I haven't taken them up. We need to be careful with the new systems we are developing – we must have training conducted otherwise we won’t use the systems properly or get the efficiencies. Even if they see the strategic benefit of using a system, if they haven't been trained to use it properly and see the benefits to them, they still won’t use it to its full.

*Have you received sufficient training to understand and use the outputs from the systems?*

I wouldn’t say training, but talking, and people telling me different things. We’ve got quite a good little network of people helping each other. It is informal, but it seems to work.

*To you think that the systems are sufficiently flexible to adapt to changes in ???s operating and trading environment?*

I suspect not, but I would think that the new systems we’re bringing in will – that’s one of the requirements – so I hope they are.

*On a scale of 1-10…………1 very stable, 10 very unstable*

7. We have loads of influences on us that affect us, regulatory and economy and allsorts.

*When assessing the success of a new system, how would you rank the following?*

User satisfaction, strategic fit, increased operating efficiency, ROI, cost reduction.
Would you agree with the statement that ???'s investments in technology always meet the objectives set for them?

No, because I think that sometimes the objectives are a bit unrealistic. They are not always practical.

What percentage would you say fail to meet the objectives?

To date I would say about 30%.

To what extent have systems within ???' successfully included consideration of the following issues?

Their contribution to business goals and needs.

Not in the past but now we are doing that.

Their impact upon organisational structures and processes.

They didn’t at all in the past, but they're now doing that, but I think that we still haven't seen quite the size of it.

Their impact upon work organisation and job design.

Again the same.

Their usability.

It's this practicality thing, and making sure people are comfortable and feel a real reason to use the systems. We need to work harder on that.

Their impact upon H&S.

I would say that throughout this company H&S is a very high priority on all things.

Their ergonomic aspects.
I think we’re getting better at that one, but it still needs watching – it’s very important.

*Their impact upon training and skills.*

We’ve underestimated in the past the amount of training and skills needed, and the ongoing coaching, because we might do a one shot thing, where everybody goes through a post box effect where they're all the same so they must be okay. There is definitely a need to re-visit and follow-up when they can actually see the implications and benefits of what they are doing.

*Do you feel that the systems in ?? have offered good value for money?*

They haven't delivered all that we needed. We've got to make damned sure that the new systems coming in do, and I think that again it is a 2-way approach. A system is a system, how you organise it and how you use it will provide the value.