

Information Systems Decision Making: Factors Affecting Decision Makers and Outcomes

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Abstract

Organisations are increasingly reliant on effective information systems (IS) yet little is known about the information and influences that contribute to their selection. Decision makers play an important role in the evaluation, acquisition and implementation of information systems in organisations. Their role during the pre-implementation phase of information systems projects is critical, yet little is known about how and why these decisions are made. This thesis explores the influences on these decisions and reports their effects. The aim of this research is to increase the understanding of what occurs during decision making in the critical pre-implementation phase.

A cross-disciplinary approach has been employed to develop a research framework informed by literature from information systems, innovation and adoption theory, management decision making and organisational decision making. A qualitative research method was used to develop four exploratory case studies. Research was conducted in private and government organisations that had implemented large information systems. An interpretive hermeneutic text-based analysis technique was used in a cross-case analysis in order to build theory and address the research questions.

Fifty-six informational and contextual factors were identified in this research as having effects on information systems pre-implementation decision making. These factors fall into eight broad thematic factor groups: confidence, decision process, opinions, option attributes, organisation, perceptions, politics and vendor attributes. This thesis concludes that there are linkages between decision factors and decision outcomes. It is argued that to achieve positive decision outcomes from information systems pre-implementation decisions, conditions for intra- and inter-organisational alignment must exist. It is also argued that information systems pre-implementation decision outcomes alter intra- and inter-organisational alignment conditions and affect future decisions.

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Dedication

To Garry, Ros and Simon: the most important people in my life.

and

To Pascal, Portia and Tabitha: the feline equivalents!

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'In life's school of wars, that which does not kill me, makes me stronger.'

Friedrich Nietzsche

When I began writing these acknowledgements, I thought that the task would be relatively straight forward. It was something I had been really looking forward to as I had day dreamed scripting the narrative in my mind prior to completion. The intent was that once the thesis was submitted and (hopefully) passed, I would commit this wonderful prose to paper!

However, the reality of writing this acknowledgement has been somewhat bitter-sweet. There are many individuals who shaped the way I approached my education, my choice of profession and ultimately fostered the desire to undertake this research. However, it was never my intent to thank all of these people by name; there were simply too many, and I ran the very real risk of offence by omission. However, the very act of writing this reminded me of these individuals – some of whom are in my distant past or are now deceased.

I have been reminded how privileged I have been throughout my life to be surrounded by people who believed that the pursuit of knowledge and asking ‘why’ was important. I have been reminded of all the people who believed in me when I did not necessarily have belief in myself. And I have been reminded of those who have advised, mentored and inspired me. While I approach these memories with fondness, there is also an element of sadness that some of these people will never know how elemental they were in producing this work.

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Kieren Jamieson

Declaration

The work presented in this thesis is, to the best of my knowledge and belief, original and my own work, except as acknowledged in the text. The material has not been presented, either in whole or in part, for a degree at this or any other university.

Kieren Jamieson

Statement of prior publication

Parts of this work have been published, or accepted for publication, in the following papers:

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Jackson, J & Jamieson, K 2005, Heavenly health and aged care group, in D. A. Aaker & M. K. Mills (eds.), Strategic market management, (pp. 378-386), John Wiley & Sons, Sydney.

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Chapter 1

Introduction

1.1 *Introduction*

This thesis documents an investigation into the factors that affect information systems (IS) pre-implementation decisions and the relationships these factors have with decision outcomes. This chapter begins with a brief overview of the background to the problem and identifies the justification for the research. The research problem and methodology are then described. The chapter concludes by describing the structure of the thesis and the definitions and acronyms used throughout the study.

1.2 *Background and history*

Information systems have become a vital part of the workplace, yet there is still little understanding of what factors contribute to their adoption and acceptance (Yi et al. 2006). This is somewhat of a paradox given that information systems are a fundamental component of the technology-driven change taking place throughout organisations and the wider community (Kemerer 2002). The future viability and success of organisations is increasingly reliant on effective information systems (Raggad 1997), yet the incidence of successful IS implementation projects within organisations is very low (Robbins-Gioia 2002; Standish Group 1995). Decision makers play a critical role in the evaluation, acquisition and implementation of IS in organisations (Buss 1987; Schroder & Sohal 1999). Decisions are the processes and outcomes that result from assessing and evaluating factors while the act of decision making is the choice of alternatives (O'Reilly 1990). Both the act and the outcomes are influenced by a number of organisational and informational factors including cost, time and resource availability (Simons & Thompson 1998). Though a wide body of literature exists on decision processes and models (see for example March and Simon (1958), Simon (1997) and Mintzberg et al.

(1990)), little is known about the information and influences that affect IS decision makers. The decisions taken in the pre-implementation phase of IS projects are critical, yet little is known about how and why these decisions are made. This thesis explores the influences on these decisions and discusses their effects.

A cross-disciplinary view has been employed in this research to explore the issues associated with IS decision making. Literature has been drawn from areas including information systems, innovation and adoption theory, management decision making and organisational decision making. This synthesis has had a practical and a scholarly purpose. The current approach to IS research focuses, not surprisingly, on the systems themselves. When examining how to implement better IS, focus is generally limited to the attributes of the systems and the requirements of the users in the host organisations (Davis et al. 1992; Field 1997; Kippenberger 2000; OASIG 1996; Standish Group 1995). Few authors (with the notable exception of Myers (1994a; 1994b; 1997)) have considered the organisational or contextual aspects of an IS implementation. At the same time, while there is a substantial body of decision making literature, much of which is well established and accepted, little of it has been derived in the context of IS.

Perhaps this missing link would be acceptable, except that managers in organisations continue to make decisions to implement IS where the outcomes are poor. A poor outcome for an organisation can range from total IS implementation failure where millions of dollars are written off to a partial failure where a system does not meet all major organisational needs. This again leads us back to the divide between information systems and decision making literature. Much of the IS research in the past twenty years has been in some way related to preventing, identifying or describing the causes of IS failure. With the exception of causes such as lack of management support (Field 1997; Standish Group 1995) these studies have focused almost entirely on physical implementation problems. This research approach has led to inconsistent findings and

has not provided solutions that have decreased the rate of IS failure. This indicates that the failure of so many IS projects may not be simply attributable to implementation issues. It is argued in this thesis that decisions taken in the pre-implementation phase of IS projects have a substantial impact on IS project and organisational outcomes. However there has been little empirical research into how pre-implementation decisions surrounding the selection of information systems occur and what factors are used to inform the decisions. Hence the focus of this research is to increase the understanding of what occurs during decision making in this critical phase.

The limited amount of research into IS decision making has revealed a key issue: IS decisions are rarely logical or rational (Bannister & Remenyi 1999). This flies against conventional beliefs that decisions to purchase or implement information systems follow standard large capital acquisition practices. It is believed that such practices are the result of formal evaluations with logical justifications (Ballantine & Stray 1999; Doherty & King 2001; Irani & Love 2001; Lin & Pervan 2001; Verville & Halingten 2002). This raises the question: why would decision makers behave in this way?

To answer this question, we must consider decision making theory. Traditional organisational decision making theory has modelled ‘man as intendedly rational but the extent to which that rationality could be achieved was limited by the complexity of the actual situation of the decision makers’ (Mintzberg et al. 1990 p. 11). However, real-life decisions take into account goals, environmental facts and inferences drawn from the goals and facts. These goals, facts and inferences may be real or supposed (Simon 1967b). Furthermore, it is acknowledged that decision makers try to present a rational image but can also be subject to subtle or uncertain influences that can alter their decisions. The myriad of influences and biases that affect decision making are discussed in greater depth in chapter two; however, it is clear that decisions are not made on facts alone. The literature also makes distinct links with the volume of information (Grise &

Gallupe 2000) and levels of uncertainty surrounding decisions and how decisions are made (March & Simon 1958; Selten 2001).

While considering decisions relating to the selection and implementation of information systems in the context of decision theory, it will be argued in this thesis that IS decisions are sometimes made in an irrational way because of the very attributes of the decisions. These attributes include a high volume of information, a high degree of complexity and a high degree of uncertainty. These attributes are, at the minimum, precursors to a boundedly rational approach (March & Simon 1958; Selten 2001) that can have negative organisational impacts. This is not to say that bounded rationality and irrational decision making always produce negative results. On the contrary, some apparently irrational decision making in the form of reliance on instinct and gut feel can produce positive organisational outcomes.

If we acknowledge that a decision may have been made in an irrational manner, then it is also important to accept that the reasons for making a decision may differ from those provided in a justification. If we are to accept, as will be argued in this thesis, that many IS decisions are not rational, then the question needs to be asked: what factors affect IS decision making and what effects do these have on outcomes?

1.3 *Justification*

There is a gap in the literature concerning research into the factors that affect decisions made regarding the adoption and selection of IS. Schwenk (1995 p. 489) argued that ‘research into strategic decision making and the factors which affect it may allow us to better understand and improve the way in which strategists come to understand their businesses and the environments in which they operate’. It is the need for better IS decision making in organisations that underpins this research. Better decisions are those that lead to the optimal outcomes and goals for an organisation given the available

options (Hastie 2001). Whilst this thesis begins with IS project failure as the justification for the research, the objectives are to identify factors that affect IS pre-implementation decisions and identify the effects of the factors on decision outcomes. The primary goal is to gain a clearer understanding of which factors or groups of factors drive the decisions. This is done in an effort to achieve better decision outcomes for organisations. This thesis aims to build a deeper understanding of the issues surrounding IS project failure but in doing so does not claim to solve the problem.

1.4 Research problem

This research focuses on factors affecting pre-implementation decisions and their relationships with decision outcomes. The question addressed by this research is:

What tangible and intangible information and contextual factors affect decision makers when making IS project pre-implementation decisions and how do these affect decision outcomes?

From this question, the following sub-questions are examined:

1. *When making pre-implementation IS decisions, what are the tangible and intangible informational factors used by decision makers? How do these informational factors affect decision makers and decision making?*

2. *When making pre-implementation IS decisions, what tangible and intangible contextual factors affect decision makers? How do these contextual factors affect decision makers and decision making?*

- 3. Are all decision making factors formally disclosed in decision justifications? If factors are not formally disclosed in justifications, what are their characteristics? Are there relationships between factor tangibility and disclosure? Do undisclosed factors have a greater influence on decision makers than disclosed factors?*
- 4. What relationships exist between the decisions made in the pre-implementation phase of an IS project and the organisational outcomes? Are there relationships between decision factors and decision outcomes?*

In addressing these questions, the findings from this study confirm the a priori basis for the research that there are direct links between decisions made in the pre-implementation phase of IS projects and the outcomes. These findings justify the need for this research as there has not been any known research into the effects of pre-implementation decisions or outcomes.

It will be shown that fifty-six distinct factors affected decision makers during IS pre-implementation decisions observed in this study. These consist of twenty-five informational and thirty-one contextual factors. From these factors, it will be argued that eight broad thematic factor groups can be identified: confidence, decision process, opinions, option attributes, organisation, perceptions, politics and vendor attributes. It will also be argued that organisations do not disclose all decision factors in justifications and undisclosed factors have more influence on decision makers than disclosed factors.

The thesis concludes that there are linkages between decision factors and decision outcomes, and that factors often act in concert or indirectly. From decision factor-outcome relationships, broader linkages between alignment, alignment conditions and positive decision outcomes are proposed. It will be argued that to achieve positive

decision outcomes from IS pre-implementation decisions, conditions for intra- and inter-organisational alignment must exist. It will also be argued that IS pre-implementation decision outcomes alter intra- and inter-organisational alignment conditions and affect future decisions.

1.5 *Methodology*

In order to address the exploratory nature of the research questions, a qualitative research method has been used. Four detailed exploratory case studies, based on Yin's (1994) methodology, were conducted in private and government organisations that have implemented large information systems. Data was collected from multiple semi-structured interviews and organisational documentation. Following Eisenhardt's (1989) pre-analysis technique, interviews and documentation were synthesised into 'case write-ups' (Eisenhardt 1989 p. 540). A text-based analysis was performed on the data guided by Klein & Myers' (1999) seven principles of interpretive research protocol. The analysis method is based on a hermeneutic technique used successfully by Myers (1994a; 1994b). This hermeneutic process follows the iterative loop that Yin (1994) described as explanation building. From the analysis, four individual case study narratives, forming chapters four to seven, were produced. A cross-case analysis was performed in order to build theory and address the research questions. This analysis is presented in chapter eight.

1.6 *Thesis structure*

Chapter two provides a review of the literature and includes a summary of IS failure rates and known causes. Precursor decision making models are presented as the foundations of the conceptual framework for this research. Conventional management decision theory is detailed and explanations are given for irrational decision making. After examining the factors affecting IS decisions, it will be argued that poor organisational outcomes resulting from project failure occur because of decisions made

before, during and after IS implementations. It will be argued that IS project success is not simply a matter of physical implementation issues as is often thought. It will also be argued that of these, pre-implementation decisions are the most important and have the greatest effect on IS project outcomes.

Chapter three details the methodology used in this research. It begins by detailing the theoretical framework and research questions. The interpretive research design is outlined and justified. Data gathering procedures are then detailed, followed by a description of the analysis technique, including a discussion of hermeneutics. This chapter concludes with a discussion of limitations in the research design.

Chapters' four to seven present individual case studies. Each case presents findings relevant to addressing the research questions. Chapter four examines two IS projects within a commercial utility. Chapter five examines the implementation of a patient management system (PMS) at a private health care provider. Chapter six examines an enterprise resource planning (ERP) system implementation at a higher education provider. Chapter seven examines the selection of an outsourcing vendor in a Commonwealth Government department.

Chapter eight provides a cross-case analysis of the four case studies in order to address the research questions and develop theory. Each sub-question is examined and findings from each case are compared and summarised. The chapter concludes by addressing the main research question, followed by an examination of the findings in the context of comparative literature.

Chapter nine presents conclusions to the study. Implications for theory and practice are discussed and suggestions for future research are made.

1.7 Definitions and acronyms

Definitions and acronyms used in this research are detailed in Table 1-1.

Term	Definition
CBIS	Computer-Based Information Systems
CEO	Chief Executive Officer
CFO	Chief Financial Officer
CIO	Chief Information Officer
EIT	Enterprise Information Technologies – also see ERP systems
ERP	Enterprise Resource Planning systems - Enterprise wide integrated systems used for the provision of services including, but not limited to, finance, human resources, asset management and customer relations. ERPs may also encompass specialised functions such as health care and student management
GM	General Manager
IS	Information Systems - In the context of this research, the term Information Systems encompasses the Information Technology, infrastructure, systems, procedures and human resources that are required to collect, store, manage and communicate information that supports and enhances the operations of an organisation. IS include Enterprise Resource Planning systems, Electronic Commerce, Enterprise Information Technologies, Computer Based Information Systems and hardware infrastructure
IT	Information Technology

Table 1-1 Table of definitions

1.8 Conclusion

The research presented in this thesis has contributed directly to knowledge and theory by identifying a specific problem and perspective through which IS failure can be examined. Drawing together literature from the IS and decision making disciplines, a gap in the understanding of how IS pre-implementation decisions has been identified. This research has fused organisational and contextual aspects of IS implementation studies, while drawing from a substantial body of decision making literature. This fusion has resulted in the development of a contextual decision making model which has provided a novel way of examining how decisions are made. The model has been based on a synthesis of decision making literature drawing from authors including Simon (1967a; 1967b; 1997), Mintzberg et al. (1990), Heracleous (1994) and March and Simon (1958). Within this framework, this research has examined the factors that affect the IS pre-implementation decision making and their outcomes.

From the empirical data gathered, this research has been able to extend decision making theory in the specific IS context. New theory has been developed by synthesising the key research findings and aspects of IS strategic alignment literature. While previous research has concentrated on the importance of post-implementation IS strategic fit, this research has demonstrated that alignment issues play a significant role in pre-implementation decision making. Linkages have been established between conventional predictors of IS strategic alignment and predictive decision factors empirically observed in this study.

From specific findings and theory developed in this research, a series of implications and recommendations for practice have been identified. This work challenges organisations considering technology adoption to examine the organisational and technical aspects of technology adoption. This research has established that a number of

organisational factors are equally, if not more important than technical considerations in IS pre-implementation decisions. This chapter has outlined the background and justification for this thesis. The research problem and sub-questions have been stated and the methodology and structure of the thesis has been outlined. The next chapter explores the theoretical basis for this research.

Chapter 2

Literature review

2.1 *Introduction*

From the literature examined in this section, it will be argued that there is a high degree of information systems (IS) project failure and that this failure is related to pre-implementation decisions. Although IS project failure is the justification for the research, the objectives are to identify factors that affect IS pre-implementation decisions and identify the effects of the factors on decision outcomes. Decisions are critical in determining the outcomes of IS selection and implementation processes. These decisions are affected by the way in which the decisions are made, but it is argued that decision makers do not always use rational decision making processes. Information and contextual organisational factors affect the decision making process; yet the effects and relationships between these factors on the decisions are not fully understood. The primary goal of this research is to gain a clearer understanding of which factors or groups of factors drive decisions. This is done in an effort to achieve better decision outcomes for organisations. In this section, it is argued that it is the pre-implementation decisions, not the implementation or execution of IS, that contribute significantly to sub-optimal outcomes for organisations. Further research is required into the relationships between pre-implementation decision making factors and decision outcomes for both IS management theory and practice. This thesis aims to build a deeper understanding of these relationships in order to address one aspect of the issues surrounding IS project failure.

This chapter begins with an overview of the failure rates affecting IS projects and the failure causes described in the literature. IS evaluation processes and practices are

outlined and it is proposed that evaluation techniques are often non-structured and only provide an illusion of rationality to decision making. Decision making theory is then explored beginning with a definition of decision making, followed by an explanation of the classifications of rational and judgement decisions. The effects on decision making of information bias, cognitive biases, risk and uncertainty are then discussed.

Organisational decision making models are described and the limits of these models are discussed. Following this, an alternative contextual decision making model that forms the basis for the research is proposed. The factors within the contextual decision making model are explained and the importance of factor acknowledgement in decision making is highlighted. Finally, the a priori argument for this research, that pre-implementation decision making has equal if not more effect on the outcomes of projects than implementation issues, is made.

2.2 Organisational research significance

In 2005, it was conservatively estimated that over US one trillion dollars was spent on IS projects world wide (Charette 2005). IS projects often involve the implementation of systems, infrastructure, services and technology that have not previously existed in an organisation: it is recognised that many projects end in failure (Cozijnsen, Vrakking, & Ijzerloo 2000). The failure rate of IS projects is alarmingly high (Mahaney & Lederer 1999) given their significant negative organisational consequences in terms of cost and loss of productivity.

A 1997 KPMG study found one of the key reasons that projects failed was that IS projects were started without the existence of a strong business case (Whittaker 1999). This suggests that decisions to implement IS are being taken without being principally based on organisational business needs and that this in turn is leading to IS project failure. Further discussion of this topic is provided in section 2.4 (see page 21). In this section, IS project failure rates are examined. The measurement of failure and success

are discussed and factors affecting failure are provided. This section identifies and quantifies the problem of IS failure facing organisations in order to demonstrate the significance of the research into IS pre-implementation decision making.

2.2.1 Failure rates

The Standish Group's CHAOS (1995) report indicated that up until 1995, over fifty percent of IS projects cost an average of one hundred and eighty-nine percent of their original expected value. Over thirty percent of all IS projects in the United States were cancelled at an estimated cost of over US eighty-one billion dollars. Only sixteen percent of IS projects finished on time and on budget (Standish Group 1995).

Kippenberger (2000) indicated that UK studies from the 1990s indicated that seventy-seven percent of IS projects fail. Cozijnsen, Vrakking et al. (2000) noted that between seventy and eighty percent of innovation projects failed either completely or partly.

More recent studies (Cooke, Gelman, & Peterson 2001; Lemon et al. 2002; Robbins-Gioia 2002) suggest that the rate of IS project failure, between forty and sixty percent, is not declining. Indeed, the latest 2004 studies from the Standish Group indicated that over US fifty-five billion dollars was lost in failed or over-run projects with as low as twenty-nine percent of all IS projects being classed as successful (Software Mag.COM 2004; Standish Group 2004). With such high failure rates, why do organisations continue to embark on large IS projects? In 1998, it was estimated that the United States alone spent more than US two hundred and seventy-five billion dollars on software projects (Standish Group 1998) and that in 1995, US eighty-one billion dollars was spent on cancelled projects and a further US fifty-nine billion dollars was spent over the initial project budget estimates (IT Cortex 2002c).

Even when projects are completed, there is no guarantee they are perceived as successful. The OASIG (1996) report found that eighty to ninety percent of all IS investments do not meet their objectives and that around eighty percent of systems are

delivered late and over budget. However, it was noted that IS performance evaluation is difficult to assess and is very rarely systematically evaluated against the stated system objectives. It is worth noting that while the literature tends to concentrate on abandonment and budget over-run as definitions of failure, an IS project that implements a system lacking in essential functionality is arguably far more of a failure than one that over-ran its budget but delivered all the required functionality. As this is difficult to quantify, the real level of IS failure could be far greater than is reported.

2.2.2 Measuring success and failure

The measurement of the success of an IS project can be determined in a number of ways; however, a general measure is that a project was completed on time and on budget (IT Cortex 2002d; Standish Group 1995) with the desired functionality (Mahaney & Lederer 1999). The 1997 KPMG survey discussed by Whittaker (1999) focused on what constituted project failure. They deemed an IS project as having failed if it over-ran its budget *or* schedule by thirty percent, or if the project was cancelled or deferred due to non-delivery of planned benefits. Mahaney and Lederer (1999) argued that there are degrees of failure and that a project that over-runs budget by five percent is less of a failure than one that over-runs by fifty percent. However, there appears to be very little literature that discusses the long-term measures of a project's success in terms of what the project has really achieved and its ongoing consequences for the organisation. IS projects can also be deemed as failures if the solution delivered lacks the ability to evolve and grow with the organisation (IT Cortex 2002d). The IT-Cortex (2002d) report seems to give a more realistic appraisal of project success factors. Apart from the ability to evolve, the report states that an IS project has failed if the solution does not integrate well with the business environment, if there is a lack of consistency between the initial requirements and the final solution, or if the project simply does not make business sense.

While the statistical evidence (see for example OASIG (1996), Cozijnsen, Vrakking and Ijzerloo (2000) and the Standish Group's CHAOS (1995) report) deals directly with IS projects that have been identified as failures, anecdotal evidence suggests that many IS projects, lauded as successes, have produced less than optimal results for the implementing organisation (Remenyi & Sherwood-Smith 1999). This can be observed in IS development projects when one group views the project as a success while others see it as a failure (Standing 1998). As stated in the OASIG (1996) report, people are rewarded for getting systems in on time while there is a belief that they can fix mistakes later. While a project may be a technical success in terms of being on time and on budget, the system may be faulty and require extensive fixes and modifications, producing poor outcomes for the organisation.

The issue of how to measure success or failure is not trivial, as the success or failure of a system is seen as a matter of interpretation and that interpretation can change over time (Myers 1994b). As DeLone and McLean (1992 p. 61) pointed out, 'there are nearly as many measures of success as there are studies'. DeLone and McLean (1992) proposed six interdependent measurements of success: system quality, information quality, use, user satisfaction, individual impact and organisational impact. It is important to note that all of these factors should be considered when trying to measure success under the model and that no single measure is intrinsically better than any other. Attempts have been made to refine and expand on their model (see for example Seddon et al. (1999)) and have included a further refinement from DeLone and McLean (2002) where they proposed a new measurement, service quality. DeLone and McLean (2002) altered their model so that individual impact and organisational impact are combined into the new variable, net benefit. However, different actors have different opinions as to what a benefit is (DeLone & McLean 2002) thus the success of a system is still largely perception based and will depend on which actor is performing the assessment (Middleton 1995). As Myers (1994a p. 65) stated, 'Information systems success is

achieved when an information system is perceived to be successful by the stakeholders and other observers'. However, this definition is lacking given that it would be unlikely for *all* stakeholders and observers to agree on the perception of the success of an IS project at any given time.

2.2.3 Factors affecting failure

Factors such as organisational size, project cost and project duration have an effect on project success (Mahaney & Lederer 1999; Standish Group 1998). It appears that as the cost of the project rises, so does the risk of failure (Standish Group 1995).

Implementation issues such as lack of user involvement (OASIG 1996; Standish Group 1995), poor project management (Ainsworth 1999; Ewusi-Mensah 1997; Kippenberger 2000), resourcing, risk management (Standish Group 1995; Whittaker 1999), organisational expertise and project size (Cannon 1994) also affect project outcomes.

Table 2-1 summarises some of the failure causes identified in the literature.

Failure cause	Reference
Incomplete requirements	(Davis et al. 1992; Field 1997; Kippenberger 2000; OASIG 1996; Rippingale 2003; Standish Group 1995)
Lack of user involvement	(Davis et al. 1992; Field 1997; OASIG 1996; Standish Group 1995)
Lack of sufficient resources	(IT Cortex 2002a; Standish Group 1995)
Unrealistic expectations	(Davis et al. 1992; Field 1997; Rippingale 2003; Standish Group 1995)
Lack of executive support	(Field 1997; Standish Group 1995)
Lack of planning	(IT Cortex 2002a; Kippenberger 2000; Rippingale 2003; Standish Group 1995)
Technology no longer required or has changed	(Field 1997; Standish Group 1995)
Lack of IS management or leadership	(Kippenberger 2000; McBride 2004; Standish Group 1995)
Technology illiteracy of management	(Davis et al. 1992; Standish Group 1995)
Unclear objectives/inadequate definition	(Field 1997; Kippenberger 2000; Rippingale 2003; Standish Group 1995)
Inappropriate personnel/lack of expertise	(Cannon 1994; Field 1997; Kippenberger 2000)
Ineffective control measures	(Field 1997; Kippenberger 2000)
Poor communication	(Davis et al. 1992; IT Cortex 2002a; Kippenberger 2000)
Poor project management	(Ainsworth 1999; Ewusi-Mensah 1997; Field 1997; Kippenberger 2000; McBride 2004; OASIG 1996)
Unrealistic timescale	(Field 1997; Kippenberger 2000; Standish Group 1995)
Lack of quality control	(IT Cortex 2002a)
Over emphasis on organisational cost reduction	(OASIG 1996; Rippingale 2003)
Poor risk management	(Standish Group 1995; Whittaker 1999)
Project size (project too large)	(Cannon 1994)
Flawed process	(Rippingale 2003)

Table 2-1 Causes of IS failure

As Myers (1994a) pointed out, there is a lack of consistency between the failure factors found to be important over multiple studies. One possible reason for this is that there simply is not a magic combination of elements that guarantees failure. It is possible that the factors that contribute to IS failure are symptoms or manifestations of deeper problems.

While research has been directed into implementation, post-implementation and organisational issues associated with IS failure (see Table 2-1), the issue of the pre-implementation process is for the most part being ignored (Verville & Halingten 2002) and certainly little empirical research is occurring on why these decisions were made. IS evaluation has traditionally focussed upon assessing the financial benefits and costs prior to the systems development process (Doherty & King 2001). However, there has been little research conducted into the specific factors that contributed to pre-implementation IS decision making and how these affected organisational outcomes: this research addresses these neglected areas in order to build a better understanding of IS project failure.

2.3 Evaluation processes and practices

IS evaluation is one of the most controversial and debated areas in the IS literature (Lin & Pervan 2001). IS evaluation practices are either not formally performed (Ballantine & Stray 1999; Khalifa et al. 2001; Lin & Pervan 2001) or are narrow in focus (Irani & Love 2001). Ballantine and Stray's survey (1999) indicated that over fifty-one percent of organisations did not use well-defined evaluation procedures. One of the reasons for this was a perceived difficulty in interpreting the results of formal evaluations. A lack of organisational resources has also been cited as another reason for not performing formal IS evaluations (Khalifa et al. 2001).

Traditional IS evaluation practices focus heavily on financial costs and returns (Ballantine & Stray 1999; Doherty & King 2001; Irani & Love 2001; Lin & Pervan 2001; Verville & Halingten 2002) and perceived benefits (Drinjak, Altmann, & Joyce 2001) yet ignore or marginalise other organisational and human issues (Doherty & King 2001; Khalifa et al. 2001). Formal financial evaluation practices include cost benefit analysis (CBA), return on investment (ROI), payback period (PB) and net present value (NPV). Although these methods provide tangible information that can guide the

selection process, they ignore human and organisational issues. In an IS investment, this can lead to project failure (OASIG 1996): consequently, Irani and Love (2001) indicated that a number of practitioners are calling for a moratorium on the use of such evaluation practices. Daft and Lengel (1990) noted that rational models or evaluation practices that rely on quantitative analysis and statistics are more often used for operational and technical decisions at lower levels of management. Quantitative analysis and statistics may be appropriate for decisions taken at lower levels of management, yet the same methods are frequently used by senior management to justify more complex decisions.

Bannister and Remenyi (1999) divided evaluation approaches into three broad categories: fundamental, composite and meta. Fundamental techniques rely on metrics and distil every decision option down to a single metric or score. Composite measures combine several fundamental measures to gain an overall picture of value or investment return. Meta measurement involves a selection of the best set of fundamental measures for a given context. Evaluations using meta measurements use different metrics or factors depending on the context or type of evaluation. Furthermore, Bannister and Remenyi (1999) described the actual decision process as occurring in one of two ways: positivist or hermeneutic. Positivist decision techniques empower the evaluation methodology to make the decision. Hermeneutic decision techniques allow for the interpretation of factors in a non-structured way. This is a more realistic model of the way in which many IS decisions are made as decision makers are often affected by organisational factors that shape decision processes.

There is also evidence to suggest that evaluation practices are geared to justify choices (Drinjak, Altmann, & Joyce 2001) and that decision makers often have preferred or preconceived outcomes (O'Reilly 1990). Many organisations exhibit actions which attempt to create the illusion of rationality (Straw 1990) and the evaluation or

justification process can be one of these. This raises the question of why there is the need to create the illusion of rationality.

2.4 *Decision making*

The focus of this research is the identification and understanding of the role of factors informing pre-implementation decision making in IS. In a study by Simons and Thompson (1998), decision makers reported that a number of environmental, organisational, situational, individual and content-based factors impacted on their decision making: these factors will be discussed in section 2.5.2 (see page 50). Of these factors, the greatest variation identified related to organisational and environmental factors. The use of simplified cognitive processing and heuristics is a recognised facet in complex decision making (Eagly & Chaiken 1993; O'Reilly 1990). However, while organisational decisions are intentionally rational (Straw 1990), decisions relating to IS are rarely logical (Bannister & Remenyi 1999) or rational (Bannister & Remenyi 1999; Chung & McLarney 1999; Heracleous 1994; Standing 1998). It appears that for large, complex and ill-structured problems, decisions are largely based on instinct or intuition (Bannister & Remenyi 1999). Burke and Miller's (1999) study of intuitive decision making in professionals found that fifty-six percent of respondents made decisions based on experience, while forty percent based their decisions based on feelings or emotions when presented with information. This raises the question of what information was informing these intuitive decisions and how did it affect decision outcomes. While two thirds of the respondents felt that intuition led to better decisions, one interviewee noted that 'if your recollection and experiences are wrong then intuition is bad' (Burke & Miller 1999 p. 94). Intuitive decision making lacks transparency and acknowledgement of uncertainty in decision making and may create a false sense of security, potentially leading organisations down the path to IS project failure. Without open acknowledgement and scrutiny of the real reasons behind complex decisions, bad decisions will continue to be made. Drawing from decision making theory and the

extant literature, this section defines and describes methods of decision making. This section concludes with a description of an alternative decision making model that provides the framework for this research. The model captures the information and contextual factors used in decision making and current IS evaluation processes and practices.

2.4.1 **What are decisions?**

Decisions are situation-behaviour combinations consisting of alternatives, uncertain events and consequences (Hastie 2001). A decision making process can consist of the three inter-related tasks; information acquisition, evaluation and feedback or learning (Einhorn & Hogarth 1981). This premise informs the basis for the basic model of decision making depicted in Figure 2-1 whereby factors inform a decision process that produces outcomes.

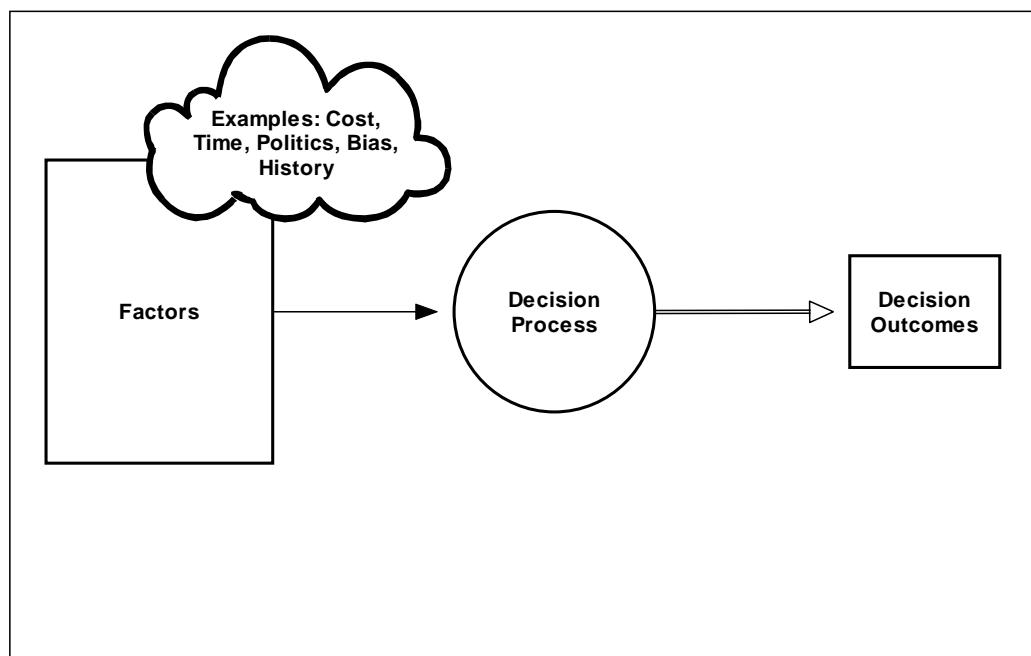


Figure 2-1 Basic decision making model

Decision makers use a number of environmental, organisational, situational, individual and content-based factors to make decisions including hard information and soft heuristics (Simons & Thompson 1998). Factors include information directly pertinent to

the decision and broader contextual influences. For example, an IS purchase decision may be informed by the purchase price of the product, but also may be influenced by the reputation of the vendor. There is some difficulty in defining what makes a decision ‘good’ as every organisation, situation and decision is different. A good decision can be defined as one that effectively achieves the decision maker’s goals given the available resources and constraints (Hastie 2001). The decision outcomes are the publicly describable situations that occur as a result of a decision and the consequences which are the subjective evaluations of outcomes (Hastie 2001). An example of an organisational decision outcome that is pertinent to this research is the adoption of an information system.

Mintzberg (in Mintzberg et al. 1990) noted the problems associated with the concept of a decision. He highlighted the distinction between the commitment to a decision and the actions or outcomes that result from the decision. Mintzberg (in Mintzberg et al. 1990) refined the definition of a decision to the commitment to action, and that decisions implicitly precede actions. Butler (in Mintzberg et al. 1990) described the connection between decision and action as problematic and concluded that, while a decision is an intention to act, what follows becomes a degree of implementation. However, Mintzberg (in Mintzberg et al. 1990) and Butler (in Mintzberg et al. 1990) also noted that the relationship between decisions and actions can be difficult to uncover simply because sometimes relationships do not exist. In other words, sometimes actions occur that cannot be linked back to decisions. Furthermore, decision making can be complicated by timing. Mintzberg (in Mintzberg et al. 1990) raised the issue of the timing of commitment to action. Is a decision made when it is recorded formally or is it really made when it is decided within a person’s mind? This problem was studied by Russo, Meloy and Medvac (1998) who concluded that decision makers form decisions or strong preferences even before being asked to make a formal judgements and commitments to action. This is an important element that needs to be factored into

decision making models. In any decision making model, a contextual factor such as a decision maker's prior access to information sources will affect decisions. For example, a decision maker who is regularly provided with marketing literature on the benefits of adopting a certain information system may build a stronger preference for the system than a similar decision maker who has not had access to that information. When it comes time for the organisation to adopt an information system, the decision maker with the preconceived preference is likely to choose that product (Russo, Meloy, & Medvec 1998).

2.4.2 Types of decisions

In logical, rational decision making, alternatives and goals are explicit, consequences of choosing alternatives are calculated and these consequences are evaluated against the goals (Simon 1987). In judgement (non-logical) decision making, analysis of alternatives and consequences against goals often is not possible. These decisions are characterised as being rapid, usually where the decision maker is unable to describe either the grounds or process whereby the decision was made. This section briefly discusses common decision types and styles.

2.4.2.1 Rational decision making

Simon (1967a) described the traditional rational decision maker, known as the economic man, as one who is assumed to have acquired all the knowledge relevant to the decision. It is assumed that the rational decision maker uses this information to form assessment criteria which are used to assess decision alternatives. The alternative that achieves the highest ranking against the decision maker's preferences is the one chosen. The decision maker seeks to optimise or maximise their decision alternative (Simon 1967b). Mintzberg & Westley (2001) describe this form of decision making as thinking first whereby the decision is made in a logical, clearly identified process of: define, diagnose, design and decide. The rational approach is useful when the issues are clear, the data is

reliable, the context is structured, thoughts can be pinned down (that is, thinking is clear and identifiable) and discipline can be applied. It is useful in established production processes (Mintzberg & Westley 2001) however a purely rational approach to decision making is uncommon (Mintzberg & Westley 2001).

Simon (1967a) believed that the rational model was flawed as decision makers did not behave this way in reality. In Simon's (1967a) paper, he refined the model and suggested that real human behaviour was somewhat different. Not only did decision makers simplify their information gathering, but they also evaluated decision alternatives based on a simplified pay-off function. The pay-off function led to alternatives being chosen not because they were necessarily the best, but because they crossed some acceptable level or threshold. Simon (1967a) also noted the relationship between the aspiration level of the decision maker and the sequential search for decision alternatives. An aspiration level is the point at which a decision alternative becomes acceptable (Selten 2001). If it is easy for acceptable decision alternatives to be found, then the search level decreases and aspiration levels rise. Conversely, if it is difficult to find acceptable decision alternatives, searching increases and aspirations drop (Simon 1967b). This form of limited rationality uses satisficing instead of maximising to search for decision alternatives and make the alternative selection. Hence it is subject to the contextual influence of alternative availability.

This type of non-optimising, satisficing decision making is referred to as bounded rationality (March & Simon 1958; Selten 2001). Simon (1997) pointed out that while humans are intentionally rational, they are only boundedly so. This behaviour, described under Simon's (1997) theory of administrative behaviour as the administrative man, accepts that decision makers, while wanting to make the best decision, are often constrained and simply take the option that is acceptable. Boundedly rational decision makers accept that they can only operate with a simplified view of the world with

limited information and stimuli. Boundedly rational decision makers accept that they are unable to access or use all of the information found in the complex real world that is attributed to the rational, economic decision maker (Simon 1997). This simplification allows for decisions to be made on incomplete information, often by rule-of-thumb. The restrictions on what information is available can be considered a function of contextual factors including agreements with external organisations and access to information (Daft & Lengel 1990; Sarkis & Sundarraj 2000).

2.4.2.2 Judgement decision making

While rational decision making deals with known processes and logically structured decision steps, judgement decision making deals with intuition and instinct (Simon 1987). Simon (1987) argued that it is impossible, in fact a fallacy, to isolate and contrast the two as totally separate styles. Despite this, there are still many authors who treat the two types of decision styles differently (for example Hastie (2001) and Shafir and LeBoeuf (2002)). However, Simon (1987) gave an example of the dual-style decision making by highlighting the importance of intuition in chess players. He pointed out that with expert, grandmaster chess players, the time taken to consider their next move mostly consists of validation time, otherwise described as logical decision making. However, there is an initial small period of time, often less than a minute, where the player develops the move, by applying their judgement or intuition. This is a characteristic of naturalistic decision making (Meso, Troutt, & Rudnicka 2002). Simon (1987) pointed out that this type of behaviour occurs in many other professions, but cautioned that the decision outcomes are not always good.

Mintzberg and Westley (2001) described this type of decision making as *seeing first*. Seeing first decision making relies on insight and vision. It uses four steps as part of a creative discovery process that leads to the eventual decision: preparation, incubation, illumination and verification. Seeing first decision making relies on a deep knowledge

developed over time, followed by a sustained period of almost unconscious thought where the decision maker ‘mulls over the issue’ (Mintzberg & Westley 2001 p. 90). At some point, the decision maker experiences a moment of illumination where the solution, or decision, becomes clear. This is followed by verification and logical reasoning to prove the decision. Seeing first, or judgement decisions, are useful when there are many data elements to consider or to be combined into a creative solution. Seeing first decision making is useful in areas such as new product development or innovation but relies on strong communication between decision makers (Mintzberg & Westley 2001).

Simon (1987) argued that the application of this type of expert intuition is related to the decision maker’s ability to recall patterns and their significance. When confronted with the same or similar patterns to those of previous experience, the decision maker recalls the previous course of action. This type of decision making was regarded by Brindle (1999) as a cognitive game or misuse of analogy that potentially misled the decision maker. However, the success of this technique would appear to depend on the experience of the decision maker and their ability to correctly identify patterns. As noted by Burke and Miller (1999), if a decision maker’s experience and recollection is wrong, then their intuition and resulting decisions are also likely to be bad. In their study, Burke and Miller (1999) indicated that fifty-nine percent of professionals used intuition either frequently or all the time in decision making on a day-to-day basis. Their findings indicated that of the professionals surveyed, two thirds thought that intuition led to better decisions. Burke and Miller (1999 p. 91) also found that ‘intuition may be beneficial in certain scenarios, and at many times may be the primary decision approach available’.

Organisational decisions that are judgement or seeing first are subject to a number of contextual factors. Organisational memory and the reapplication of patterns to solve

new problems based on decisions of the past require the acknowledgement of the contextual element of organisational knowledge or history (March & Simon 1958). The level of in-house organisational expertise will also affect the ability to make such decisions. Both factors will affect the approach to the decision making process.

2.4.3 Effects on decision making

As Simon (1987) noted, intuition does not operate independently of logical analysis as the two elements are complementary in a decision making processes. While Simon (1987) understood that elements such as stress play a part in the rationality of decision making processes, he also noted that there are a number of cognitive and environmental influences that also affect decisions.

2.4.3.1 Information bias

When choosing amongst alternatives, decision makers often unconsciously distort information. This is variously known as desirability bias, optimism, outcome bias, value bias and wishful thinking (Russo, Meloy, & Medvec 1998). In their study of pre-decisional information distortion, Russo, Meloy and Medvac (1998) found that the formation of preferences occur without instruction and this led to subsequent pre-decisional distortion of product information. They also found that pre-decisional distortion is proportional to prior confidence in the leading alternative. This means that even when decision makers are not asked to choose an alternative based on information presented to them, they still automatically form a preference. This preference then biases or distorts their decision making process. The study also found that even when presented with clear, factual, non-subjective decision-relevant diagnostic information that presented contrast information between alternatives, people still exercised individual pre-decisional distortion. Russo, Meloy and Medvac (1998) noted that pre-decisional distortion presents a genuine risk to choice accuracy. They also provided a possible reason for this bias:

The desire to reduce effort might lead to pre-decisional information distortion, as follows: Distortion builds confidence in the leading brand, which enables a sufficient level of confidence to justify stopping the search for product information sooner than it would have been without distortion. Earlier stopping saves the effort of additional information search (Russo, Meloy, & Medvec 1998 p. 448)

This behaviour reinforces the satisficing decision making in Simon's (1967a) rational model and that of his theory of administrative behaviour and the administrative man (Simon 1997). Information bias is a function of the contextual influences such as availability of information and contact with external organisations. The extent to which this bias will affect a decision will depend on how rigid and transparent the decision process is or needs to be.

2.4.3.2 Cognitive biases

Duhaime and Schwenk (1985) argued that the amount of information available in decisions often exceeds decision makers' processing limits. Decision makers are often unable to cope with all the information relevant to a decision, so they simplify the decision making process by applying cognitive filters or biases. Brindle (1999) referred to these biases as cognitive games. The four main biases that Duhaime and Schwenk (1985) identified were *reasoning by analogy*, *illusion of control*, *escalating commitment* and *single outcome calculation*.

Reasoning by analogy is the application of analogies from simple situations to complex strategic problems. Duhaime and Schwenk (1985) noted that this scaling of analogies from simple to complex problems can lead to an oversimplification of the decision and the information being considered. Brindle (1999) called this bias the *misuse of analogy*

game and described it as the process of comparing and referencing other decisions to the decision under consideration. This analogy provokes a subtle emotional bias that causes the decision maker to either focus on, or ignore, certain information. The criterion for information inclusion or exclusion is based on its relevance to the original comparative decision. Types of information that were included in the original decision are included in the active decision. Conversely, information types not considered in the original decision are ignored. This type of bias can also lead to elimination of decision alternatives if they are similar to failed selected alternatives in previous decisions. Finally, misuse of analogy can be used to build support for a decision alternative. This occurs when an alternative is the same or similar to the selected alternative in previous decisions. Reasoning by analogy is part of the contextual effect of organisational knowledge and history on decision making.

The *illusion of control* is where decision makers overestimate both the extent to which the outcomes of a decision are under their personal control and their ability to correct or fix problems should they arise as a result of a decision. There is also an overestimation of the personal ability of the decision maker to actually make the decision. This form of bias tends to occur in individuals who have experienced prior success in complex decision making. Decision makers affected by this bias tend to focus on the parts of the decision they can control and not think about factors that exhibit uncertainty. They also overestimate their own abilities in order to reassure themselves in the face of uncertainty. *Illusion of control* is the result of the contextual effects of the ownership, cultural and political structures of the organisation.

Escalating commitment is the tendency for a decision maker to maintain and increase support for a decision, even if the decision appears to have had negative consequences. An example of this occurs when a decision is made to acquire a product. Following the decision, there is a significant feeling of personal responsibility by the decision maker to

remain committed to the product, even if it is not performing. In such an example, the escalating commitment bias would deter divestment. This is a potentially harmful bias as there is evidence of its negative effects, particularly on IS projects, in the literature (Mahaney & Lederer 1999; Smith & Keil 2003). *Escalating commitment* is part of the contextual effect of organisational history on decision making.

Single outcome calculation is the restriction of decision alternatives to the most promising ones as determined by shared beliefs within the organisation at the time of the decision. This provides a rapid convergence of options but restricts creative alternatives. This restriction of alternatives can be as severe as a single option without any search for alternatives. In contrast with *escalating commitment bias*, *single outcome calculation* is common in the case of divestment where the organisation reaches the collective belief that a failing capital investment decision must be reversed. This type of bias reduces stress in the decision making process. This bias is an effect of the contextual factor of uncertainty on decision making.

Other biases or games include the *framing game*, the *criteria selection game* and the *rationality game* (Brindle 1999). The *framing game* is concerned with the way a problem is defined and constrained. If a problem's dimensions are reshaped, this affects the information sought and decision alternatives developed. Once framing occurs, so does the commitment to the way in which the decision is being made. This can be thought of as a combination of Bainbridge's (2002) *overconfidence bias* and Duhaime and Schwenk's (1985) *escalating commitment*. Decision makers become attached to their understanding of the problem and the decision alternatives. They become increasingly less predisposed to admit new information and alternatives into the decision process. Sometimes framing is simply a case of not really looking at the real problem (Brindle 1999). As Brindle (1999 p. 609) noted 'sometimes, decision makers are not aware of their real agendas, but present the problem, often with perfect integrity, as the

way they “see” it’. This bias can be seen as the combined effect of a number of subtle contextual factors including politics, power structures, culture and levels of uncertainty.

The *criteria selection game* is described as the bias decision makers have towards measurable, quantitative data as opposed to less measurable qualitative data (Brindle 1999). Decision makers like simplified, easy to understand data, even though this may omit details that are necessary in the decision process. Maritan (2001) supported this with her findings that quantitative data is more heavily relied on for justifying capital investment projects. Visual data, such as graphs and charts, will be more important to decision makers than qualitative arguments (Brindle 1999). As discussed later, this game is the result of the contextual effect of uncertainty and the need to reduce information load.

Brindle (1999 p. 611) referred to the *rationality game* as ‘the most insidious game’. This bias is the process whereby decision makers produce rational arguments to constrain the information search or list of alternatives. The underlying reasons for these rational constraints are not examined and are not transparent. These restrictions limit the decision maker and the ultimate quality of the decision. The key point is that the underlying reasons are not challenged. There is a degree of cross-over between this game and Duhaime and Schwenk’s (1985) concept of *single outcome calculation* in that organisational beliefs quickly constrain the list of alternatives. This game can be seen as the combined effect of a number of contextual factors including politics, power structures, culture and levels of uncertainty.

2.4.3.3 Risk

Conventional decision making theory suggests that choice is a combination of risk and expected gain. Recent studies have indicated that risk perception is physiologically linked to emotion and these emotions are affected by how decisions are framed (Miller

2006). Decision makers who are risk-averse choose alternatives that may have lower potential gains, with smaller variations of outcomes and with relatively low risk. Decision makers who are risk-seeking choose alternatives that potentially provide higher gains, though with higher variation in outcomes and with higher risk (March & Shapira 1987). However, based on an unpublished work of Shapira's (March & Shapira 1987 citing Shapira (1986)), March and Shapira (1987) provided a number of insights into decision makers' perceptions of risk that showed variations from conventional decision theory.

The first area concerned the definition of risk and in this they made three findings. Firstly, they found that in weighing up decision alternatives, managers do not treat uncertainty about positive outcomes as risk. Risk is only associated with potential negative decision outcomes. Secondly, decision makers view risk in terms of magnitude, not probability. Decision makers view risk in terms of how much negative impact a decision alternative could cause, not the combination of probability and the impact. Decision makers look for worst outcomes or maximum losses which in themselves do not indicate risk. Thirdly, while decision makers discuss and seek precision in measuring risk in quantifiable terms, most decision makers are not interested in reducing risk to a single quantifiable figure or formula. This is perhaps not so surprising given the difficulty in establishing such metrics in the first place.

The second area concerns attitudes towards risk. March and Shapira (1987) found that the perception of risk and risk-taking varied depending on the seniority of the decision maker in the organisation. For example, senior managers saw risk taking as important and were more likely to take risks. However, March and Shapira (1987) found that in practice, most decision makers were individually risk-adverse within organisational structures. As such, they encouraged group decision making and discouraged risk taking. This contrasted with their findings relating to managers' beliefs about their

individual risk taking. Many decision makers believed that they were more judicious and less risk averse than their colleagues, while also believing they were greater risk takers than they were. Many decision makers believed that risk taking was essential to their roles and acknowledged the emotional pleasures that risk taking provided. However, taking risks also depended on the context of the decision. If a decision maker was operating above the expected performance target, they were less likely to take risks. If the decision maker operated below target, they were more likely to take risks.

The third area concerned dealing with risk. Decision makers were reported as believing that risk was a manageable issue and made the clear distinction between risk and gambling. While gambling involved inherently uncontrollable risk, risk taking involved the reduction of uncertainty and risk modification. Decision makers would seek to reduce the probability of negative alternative consequences before making the decision. However, they would often do this by reassessing or modifying the risk associated with a given alternative, either by recalculating the risk or including controlling strategies. It is clear from these findings that risk has a contextual influence on decision outcomes and processes. However, in order to mitigate risk, decision makers seek to reduce uncertainty.

2.4.3.4 Uncertainty

The level of uncertainty surrounding a decision creates a bias that alters the way in which information is gathered and the decision is made. In order to reduce uncertainty, decision makers often use cognitive games. Uncertainty is the perceived gap between the information available and the information a decision maker wants to have (Buchanan & Kock 2000). It is the difference between the knowledge required to make a decision and the knowledge a decision maker has at that time and it is often inversely proportional to the decision maker's level of problem understanding (Falzon, Zhang, & Davies 2000).

Uncertainty influences both the decision maker and the outcome of the decision. It occurs when decision makers are unable to assign definite probabilities to the consequences of decisions (March & Simon 1958). In order to reduce uncertainty, decision makers often attempt to acquire more information. Daft and Lengel (1990) indicate that as part of this behaviour, decision makers often gather and rely on more information from external sources, especially if there are limited internal sources available. However, as discussed later in this section, some research suggests that the acquisition of additional information is not necessarily informing better decisions or reducing uncertainty (Buchanan & Kock 2000; Chan 2002a; Grise & Gallupe 2000; Iselin 1993). There is also considerable evidence to suggest that providing additional information can increase uncertainty levels (Bartlet & Green 1966, Dudycha & Naylor 1966, Khon 1974 and Woodruff 1972, cited in Jacoby 1977).

Information. The measurement of the information used in decision making is described as *information load*. Information load is ‘the variety of stimuli (it consists of all data and information available to the decision maker) to which the receiver must attend’ (McCormick 1970 p. 114). It consists of external stimuli, dimensions of information, diversity of information and alternatives (Grise & Gallupe 2000). Iselin (1993) separated the concepts of information load and data load by defining data load as the number of cues or pieces of data that were not relevant to the decision and information load as the number that were relevant to the decision. This means that, of the data relevant to the decision, only a given proportion of it could be used as information directly informing the decisions. The remainder of the data, the data load, was simply discarded. It was found that increasing the data load resulted in poorer decision quality (Iselin 1993).

Part of the problem associated with the way decision makers process information is the way in which data is presented. Decision makers may be more effective when they are presented with data in a form that has a greater cognitive fit with their decision making processes (Mintzberg 1972; Umanath & Vessey 1994). If data can be manipulated and presented in a more effective way, this may reduce information load. For example, presenting data graphically rather than in tabulated form can create a better cognitive fit (Umanath & Vessey 1994). There is evidence to suggest that data manipulation leads to more *accurate* and *quicker* decisions (Vessey 1994) although more recent studies have suggested that simply converting data into graphs does not necessarily reduce information load (Chan 2002a). Even so, a cognitive game is played to reduce uncertainty by selecting information that aligns with the decision making process.

Information overload. Although uncertainty provokes decision makers to seek more information, increasing information may not decrease uncertainty. As Schroder, Driver and Streufert (1967) argued, there is a limit to the amount of information that can be integrated into the decision making process. They maintained that the information absorption peaked, and then declined, as environmental complexity and the amount of information available to the decision maker increased. This behaviour is described as *information overload* and results from ‘the finite limits of the ability of human beings to assimilate and process information during any given unit of time’ (Jacoby 1977 p. 569).

Information overload is a direct result of too much information for the available information processing capacity (Schick, Gordon & Harka 1990, cited in Chan 2002a). This phenomena has been identified as a problem in the management of information systems as it impedes the organisation and analysis of ideas and alternatives (Grise & Gallupe 2000). As *information load* increases, so does the prevalence of information overload (Grise & Gallupe 2000). This more specific problem has been referred to as *Information fatigue syndrome* (Buchanan & Kock 2000). If the increase in information creates an *information overload*, then decision makers have greater uncertainty as they

are not only unsure of the decision outcomes but are also unsure of which information is most relevant to the decision making process.

The result of this uncertainty is a vicious circle. As information load increases, the proportion of information sought decreases while the number of alternative decision outcomes sought increases (Swain & Haka 2000; Umanath & Vessey 1994). This means that as a decision maker is faced with an increasing amount of information relating to a decision, they choose to seek less of it while also searching for more possible decision outcomes or options. This means that the more complex a decision is, the less informed, systematic and thorough the decision making process will be. This has an adverse effect on decision quality (Chan 2002a) and as Chan (2002a p. 3) noted, ‘providing more information than they [decision makers] can accommodate will reduce their problem solving effectiveness and lead to poor decisions’.

The broader effect of the uncertainty biases is one of recursive cognitive games played until the decision makers perceive that their levels of uncertainty are lowered to acceptable limits. These games often rely on either selecting data that aligns with their decision making style, or by applying complex uncertainty reduction thought processes similar to the heuristic-systematic decision making style (Eagly & Chaiken 1993). The effect is that the perception of uncertainty can lead to sub-optimal decision outcomes.

2.4.4 Organisational decision process models

Traditional organisational decision making theory has modelled ‘man as intendededly rational but the extent to which that rationality could be achieved was limited by the complexity of the actual situation of the decision makers’ (Mintzberg et al. 1990 p. 11). Organisational decision making processes differ from individual decision making as they are constrained by the organisational constructs, politics, information sources and norms. Nutt (1976) described six types of organisational decision making models:

bureaucratic, normative decision, behavioural decision, group decision, equilibrium-conflict resolution and open-system. Each of these models has different characteristics and key decision criteria which are briefly discussed in this section.

2.4.4.1 Bureaucratic model

In the bureaucratic model, decision makers interpret rules to formulate decisions. These rules form part of an organisational master plan. Complex decisions require decision makers with expert skills in interpreting these master plans. While not suitable for highly dynamic environments, the bureaucratic model of decision making can be successfully applied in organisations where the decision environment is mostly routine or predictable (Nutt 1976). The weakness of this model is that it is unsuitable for complex decisions that fall outside the rule set. The model does not account for the effects of organisational politics and the intuitive expertise of decision makers. In a dynamic environment in which an organisation has to make a complex capital investment decision, such as the implementation of IS, this model fails to account for or integrate many of the contextual factors which affect the process.

2.4.4.2 Normative decision theory (NDT) model

The normative decision theory model attempts to achieve certainty in decision making by attempting to quantify the alternatives. This is achieved by examining each alternative in all possible environmental states; these combinations are known as utilities. Alternative criteria are evaluated for each utility. If there is only a single environmental state, then the decision is made by selecting the alternative with the highest aggregate criteria. However, if multiple environmental states are possible, then the probability of these states occurring has to be factored into the analysis (Nutt 1976). This model is essentially the rational model that Simon (1967a) revised.

The NDT model suffers from a number of weaknesses. It assumes that all decision alternatives can be known immediately. It is also difficult to weigh and quantify the attributes of each decision alternative and predicting all potential environmental states and their probabilities is a formidable task. It is accepted that decisions often do not cohere, are not logical and depend systematically on factors such as context, mood and the method of presentation of data (Shafir & LeBoeuf 2002). Shafir and LeBoeuf (2002) noted that the normative principles of decision making are being consistently broken by decision makers. The purely rational approach to decision making is rare and would appear incompatible with complex capital investment decisions where all environmental states and outcomes are unlikely to be known.

2.4.4.3 Behavioural decision theory

Simon (1967a) refined NDT by reducing the search for alternatives to those that would exist in acceptable environmental states. This reduction in the alternative search was a shift from an optimal decision to that of a satisficing decision. The behavioural decision theory model acknowledges that it may be impossible to examine all alternatives in all environmental states, so only a selection of the most probable occurs. This boundedly rational approach to decision making and information selection appears to be what skilful decision makers try to do when making complex decisions (Nutt 1976).

However, while this model reacts to the contextual realities of complex decisions, it does not explicitly acknowledge the influence of context over the decision process or outcome.

2.4.4.4 Group decision making

Group decision making provides a decision mechanism through group interaction. Groups consist of a number of actors who contribute expertise and leadership to the process. These actors often include the implementation agents and clients who will directly implement and work with the result of the decision process. Groups are usually

interactive although this will vary depending on the type of decision and environment. Functions within groups may include objective setting, sourcing information and developing alternatives (Nutt 1976).

Bainbridge (2002) stated that group decision making outperforms that of the individual. He argued this is because groups take advantage of aggregate institutional memory and knowledge of the group as a form of bounded rationality. In other words, instead of the group examining all information, each group member performs their own information search and summary, often in their area of expertise, returning this to the group for processing and debate.

Bainbridge (2002) argued that individual decision making suffers from the biases of herding and overconfidence. Herding is where decision makers imitate the decisions of others, even when their own information disagrees with the decision. This is a response to bounded rationality in the sense that the decision maker, realising they have limited information and a complex problem, observes the decisions of others. If decision makers perceive others as better informed, they follow their decisions and beliefs.

Overconfidence bias occurs when individual decision makers become locked into their own ideas and plans while failing to identify weaknesses in their decision that others may see. As their confidence in their decision grows, so does their resistance to accepting alternative views and criticisms. Bainbridge (2002) contended that group decision making counters this bias by forcing the evaluation of the creative efforts, or decision alternatives, of multiple individuals rather than a single biased individual.

However, groups also suffer from biases, in particular, *groupthink* (Janis 1972). Janis' extensive work concerning groupthink (Janis 1972; Janis 1982) has highlighted the many dangers of the herd mentality. Groupthink is a reaction to minimising conflict between decision makers in a group where the group strives for unanimity, even if this

reduces the quality of the decision. Groups also tend to select riskier options than individuals. This is because groups of individuals feel that there is a lack of individual responsibility and accountability associated with group decisions (Bainbridge 2002; Janis 1972; Nutt 1976). Group decision making is implicitly affected by contextual influences such as organisational culture, power structures, politics, communication networks and incentives. However, contextual influences are not explicitly acknowledged in the model, nor are their effects modelled on the outcome.

2.4.4.5 Equilibrium-conflict resolution

The equilibrium-conflict resolution model promotes organisational decision making through individual and group conflict. This conflict occurs when a decision alternative is perceived as uncertain. Organisations seek equilibrium in order to reduce or resolve the conflict. March and Simon (1958) stated that strategies of problem solving, persuasion, bargaining and politics are used in the decision process. A decision is reached, based not on being optimal or satisficing, but when the conflict is removed or decreased to an acceptable level. This may mean the reduction of uncertainty, negotiation of common goals, changes to resources or more information (Nutt 1976). This model acknowledges that organisations consist of individuals with competing interests, agendas and goals. It is the resolution of the conflict that leads to decisions being made: usually, the decisions will be made (or swayed) by the most powerful actors (Eisenhardt & Zbaracki 1992). This model recognises that many organisational actors actively engage in politics whereby they deliberately, but often covertly, seek to influence a decision. This may involve manipulating information or information flows, formation of alliances and active lobbying.

In some respects, this is the most context-driven decision model. It acknowledges the subtle effects of politics, power and uncertainty. However, conflict itself forms a contextual influence on decisions and is not necessarily the driving force behind

decision making. In capital investment decisions, high levels of conflict and uncertainty may exist yet a decision is still made. This is because other contextual factors drive the decision process, for example, time restrictions and organisation pressure.

2.4.4.6 Open-system decision making

The open-system decision making model, also known as the garbage can model, is an evolutionary approach to the development of decision goals and alternatives. While analytical decision methods require unambiguous variables and agreed evaluation criteria, an open-system model allows problems, information and preferences to emerge from groups or factions of participants. The decision maker's task is to monitor the process and eventually effect the decision of the participants (Nutt 1976). While this type of emergent decision making method may be suited to complex, ill-defined problems (see for example Hayes and McGee (1998)), it is not suitable for clearly defined capital investment problems where time is often an issue. This model is also unsuitable as it ignores contextual issues such as pre-existing organisational structures, existing expertise and culture.

2.4.5 Why are these models limited?

From the previous discussion, it is clear that decision makers can use a number of different decision making models and styles. Within the traditional framework of decision making, there is a basic distinction between what the decision maker wants and what they believe is true (Hastie 2001). The rational expectations principle proposes that each decision alternative is considered by evaluating its expected satisfaction (or dissatisfaction) with the probability of the consequences occurring. However, this theory does not account for information sources nor how they are weighted in the decision making process. While the theory is limited and does not provide a full description of decision making, it is still the dominant conceptual framework for studies into rational decision making (Hastie 2001).

Real-life decisions involve goals, environmental factors and inferences drawn from the goals and facts: these goals, facts and inferences may be real or supposed (Simon 1967b). While organisational decisions are intentionally rational (Straw 1990), decisions are rarely logical (Bannister & Remenyi 1999) or rational (Bannister & Remenyi 1999; Chung & McLarney 1999; Heracleous 1994; Standing 1998). Large, complex and ill-structured problems often rely on decisions that are largely based on instinct or intuition (Bannister & Remenyi 1999). The difficulty in quantifying the effect of these factors has to be explicitly acknowledged in any decision model. In order to develop such a model for the theoretical framework in this research, a refinement of Figure 2-1 was required. This refined model is depicted in Figure 2-2 and encompasses the intangibility aspects of some decision factors.

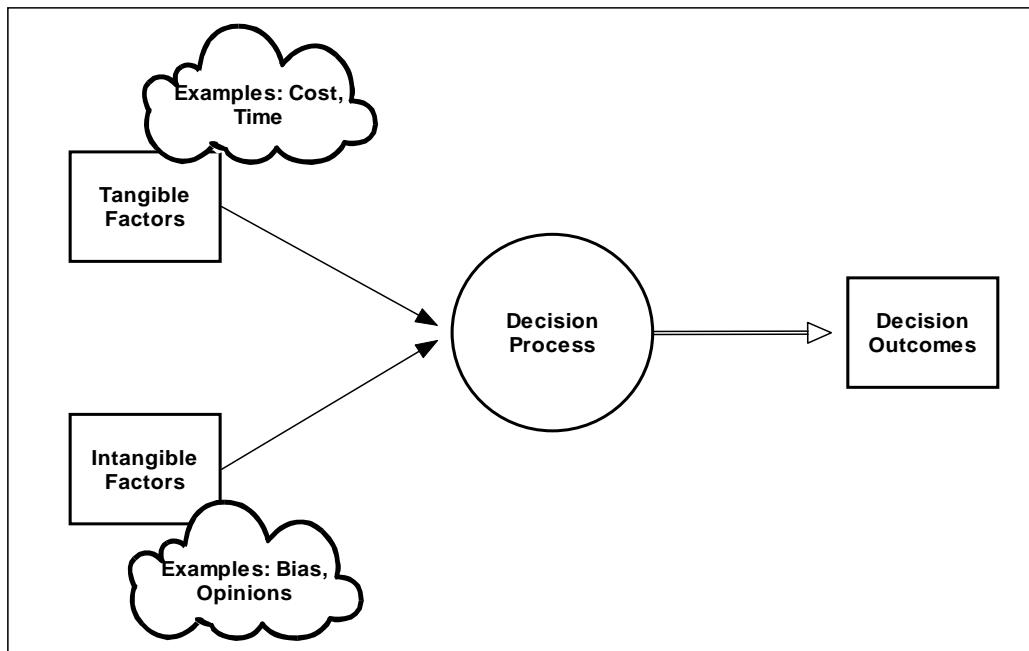


Figure 2-2 Refined decision making model

However, the model depicted in Figure 2-2 has limitations. Structured decision making processes are rarely used (Ballantine & Stray 1999; Khalifa et al. 2001; Lin & Pervan 2001) and most decisions are reached in an unstructured, hermeneutic fashion (Bannister & Remenyi 1999). Decisions often do not cohere, are not logical and depend

systematically on factors such as context, mood and the method of data presentation (Shafir & LeBoeuf 2002). More importantly, Brindle (1999) hinted at external influences on decision makers that are often overlooked:

Decision makers who have other connections are quite likely to be influenced by their networks and roles on other boards rather than primarily toward objective considerations (Brindle 1999 p. 609)

It is also acknowledged that other factors such as uncertainty play a large role in how a decision is made and what information is considered (Burke & Miller 1999; Duhaime & Schwenk 1985; Maritan 2001; Mintzberg & Waters 1982). This leads to the conclusion that decision making is not just about the evaluation of information within a vacuum.

Pettigrew (in Mintzberg et al. 1990) acknowledged this and noted the importance of looking at decisions from a contextual angle. He made four key points about the way in which decision making should be examined. Firstly, he expressed the importance of interconnected level of analysis. This means that a target decision should be examined with respect to decisions occurring at other levels within the organisation: often there are patterns between changes occurring at different levels and they are interconnected. For example, if you are examining a decision at the project level, has the way this decision been reached been similar to larger organisational decisions? Alternatively, has the decision been reached by upsizing the decision methodology, processes, or information from smaller decisions? This aligns with the literature that describes the biases and games that can affect decision making (Brindle 1999; Duhaime & Schwenk 1985).

Pettigrew (in Mintzberg et al. 1990) also emphasised the importance of the interconnectedness of the past, present and future. Conditions from the past will shape future decisions. There is also the importance of context and action. Context does not

just affect decisions through passive means but is also shaped by the actions resulting from a decision in the form of a learning-feedback loop. Finally, Pettigrew (in Mintzberg et al. 1990) noted the nature of causation concerning decisions: decisions have multiple causes and causation is not necessarily linear (Mintzberg et al. 1990). The key theme from the literature is that no matter how a decision is reached, context plays an important role in shaping the decision outcome. Figure 2-3 depicts a refinement of the decision making model that accounts for contextual factors.

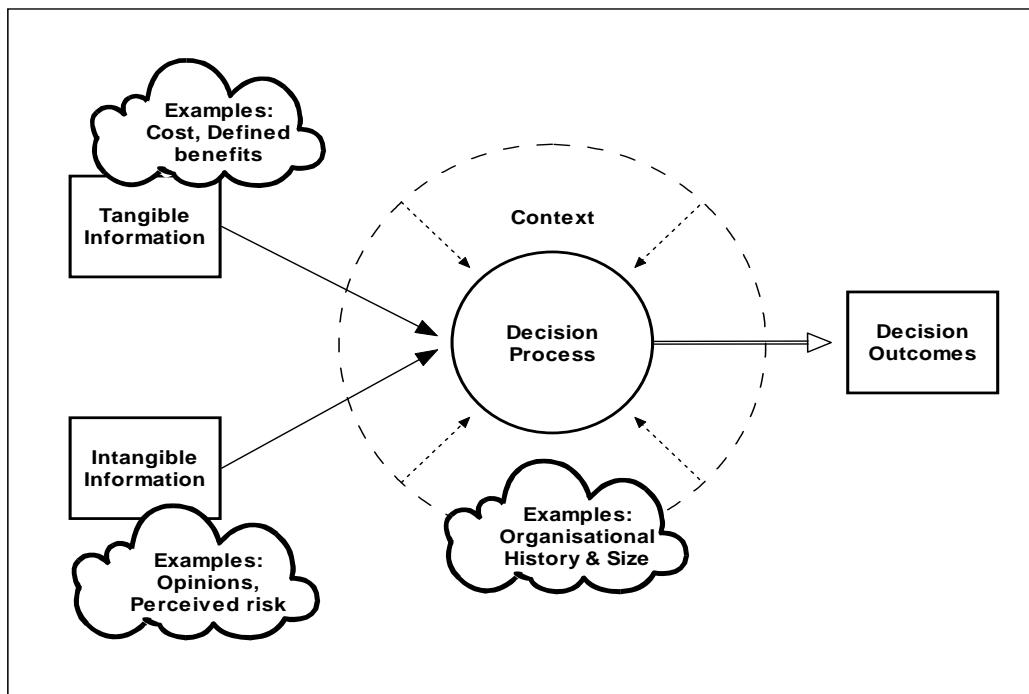


Figure 2-3 Refined contextual decision making model

2.4.6 An alternative decision making model

As discussed previously, the rationality of decision processes reduces as the complexity increases (Maritan 2001; Sharif & Irani 1999). Furthermore, there is also an increasing likelihood that contextual factors will affect the way in which information is framed and evaluated. Many of the factors that affect decision making in IS can be readily identified, however it is uncertain what direct effects these factors have on decisions outcomes. From the literature, it appears that factors can be categorised as information and context and that these act on the decision process, rational or not, to produce

decision outcomes. This contextual decision making model, based on Jamieson and Hyland's (2004a) work, is depicted in Figure 2-4. This model forms the basis for this research. From the model, it can be seen that a number of tangible and intangible factors affect a decision outcome and the decision making process. The key element of this model is the explicit acknowledgement of the effects of context over both the decision making process and the information that is used to produce decision outcomes.

Informational factors consist of data that is processed in such a way that it increases the knowledge of the person using it (Hoffer, Prescott, & McFadden 2002). Zikmund (2003 p. 21) states that information 'refers to a body of facts in a format that facilitates decision making or in a context that defines relationships between pieces of data'. This is discussed further in section 2.5.1 (see page 49). Contextual factors provide the lens or environment in which information is examined. While not an explicit consideration in a decision, a contextual factor shapes both the way the decision is made and the way in which the information is used.

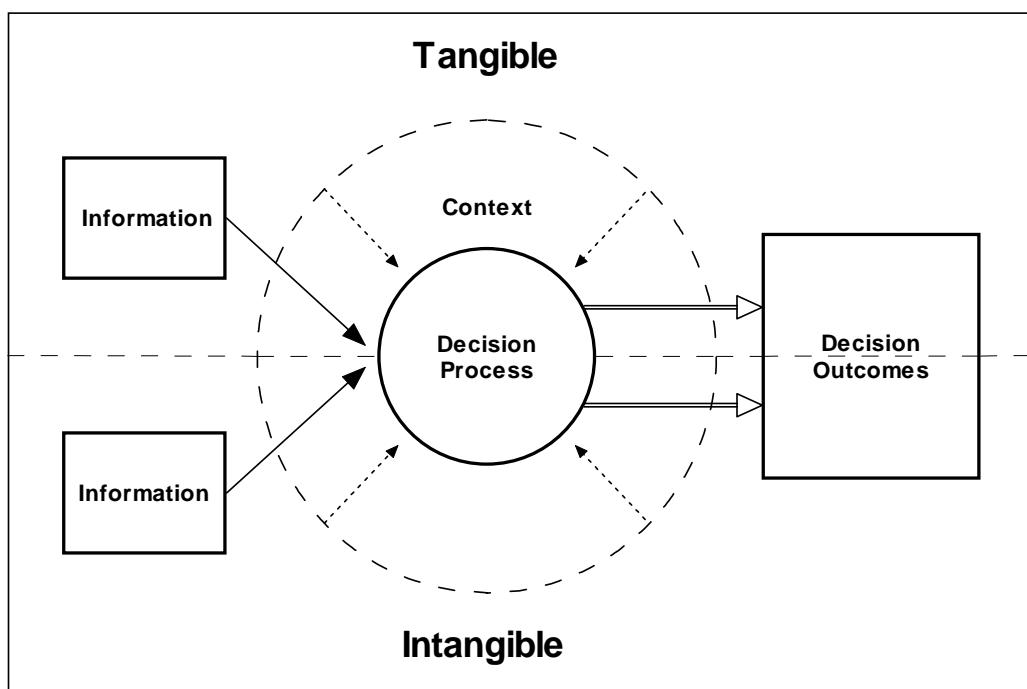


Figure 2-4 Contextual decision making model

An important element of the revised model is that the process, or how the decision was made, becomes a function of the organisational and decision context. As previously discussed, structured decision making processes are rarely used (Ballantine & Stray 1999; Khalifa et al. 2001; Lin & Pervan 2001). Furthermore, this model supports Boonstra's (2003) findings that the decision process is dependent on a number of different contextual factors such as decision urgency, the number of stake holders and solution availability. In this model, the decision process is treated as a black box where only the inputs and outputs should be examined. With the contextual model, there is no longer a need to distinguish between *rational* and *judgement* decision processes. A final component of the model is that it acknowledges that decision outcomes can be both tangible and intangible. Some outcomes may be measurable, such as productivity improvements and cost savings, while others may be less quantifiable, such as user satisfaction and morale boost.

2.4.6.1 Factor interaction

The interplay between information and the context in which it is processed can mean that it is sometimes difficult to determine if a decision factor is under active consideration as a piece of information or is acting as an influence, as context. In some instances, a contextual factor may also be represented by a piece of information. For example, the politics within an organisation may mean that a decision is taken based on the informational assessment of the political viability of one or more of the options. A contextual factor may also provide the necessary environment for information to be considered. For example, an organisation may have a focus on equity and accessibility issues, as this may be its core business. This creates an organisational awareness of such issues, thus they are considered in the decision making process. However in other organisations, without an equity focus, this information might not be considered.

In the contextual model, factors are categorised as either tangible or intangible. As previously discussed, conventional decision models have relied heavily on the ability to quantify information. This type of tangible information includes costs, resource requirements, returns and defined benefits. Risk has also been traditionally treated as a tangible factor, however it is arguable that risk is often difficult to correctly quantify and has subjective and intangible aspects. In many of the decision models, this classification has been one of convenience since most models are unable to account for intangible or unquantifiable factors. While tangible information is the most predominant factor in decision justifications, it would seem that in some decisions it plays only a limited role in the decision making process.

Intangible factors include perceived benefits or risks, organisational impacts, politics, biases and perceptions. A factor that cannot be quantified or measured must be treated as intangible. Often these factors have been overlooked in traditional decision making models. Intangibles, by their very nature, attract uncertainty. For example, it is extremely difficult to justify a multi-million dollar investment in an information system based on accumulated subliminal impressions from corporate advertising. Nor can such a decision be easily justified because of contextual politics. However, it is less difficult to justify a system based on an estimated quantifiable financial saving. From the literature, there are many decisions being made based on hunches, impressions, biases and unquantifiable perceptions. However, because these factors do not appear in traditional decision making models, they also never appear as decision justifications.

Information is evaluated within a given context or environment. Organisational factors form most of the context, although other external factors like economic climate, external politics and legislation also have effects. Some organisational factors have already been recognised as affecting decision making processes (see for example Schroder and Sohal (1999) , Sarkis and Sundarraj (2000), O'Reilly (1990) and Hirschheim and Smithson

(1987)). Examples of these include the size and type of the organisation. Context provides the lens through which information is evaluated. Context affects not only what is considered, but the importance or weighting of individual factors.

As discussed in this section, and from the broader literature (see for example Davis et. al (1992), Myers (1994a; 1994b), Ramiller (2001) and Heracleous and Barrett (2001)), it is evident that there may be a disparity between the factors used to make decisions and the factors used to justify them. For all intents and purposes, these factors are undisclosed to all but those making the decisions. Furthermore, undisclosed factors often affect decision outcomes (Heracleous & Barrett 2001). It appears that undisclosed factors may have predominately intangible and contextual characteristics. However little research has been conducted to empirically examine factor characteristics and describe these relationships. For the purposes of this research, undisclosed factors are defined as the information or contextual influences that are not explicitly identified as justifications in the decision making process yet ultimately have an effect on the final decision.

2.5 *Decision factors*

Factors that affect decision making are grouped into two categories: information and context. This section examines the types of information used to make decisions and the contextual factors that act as influences. Contextual factors are categorised and defined and finally, the relationship between factor acknowledgement and decision outcomes is discussed.

2.5.1 *Information*

Information can be defined as signs of reference that may take the form of knowledge, wisdom or raw data (Riley 2003) that form a ‘body of facts that are in a format suitable for decision making’ (Zikmund 2003 p. 738). Typically there are many factors to consider in an evaluation: these have been often categorised into one or more groups

including tangible, intangible, financial, quantitative and qualitative (Sarkis & Sundarraj 2000). Factors can be broadly divided into hard measurable metrics and soft intangibles (Frishammar 2003). Within the contextual model of decision making, these equate to tangible and intangible factors. Examples of hard factors that will justify decision making include time (Simons & Thompson 1998), financial returns and cost (Ballantine & Stray 1999; Drinjak, Altmann, & Joyce 2001; Khalifa et al. 2001; Simons & Thompson 1998). Soft factors include politics (Chung & McLarney 1999; Standing 1998), heuristics and biases (McCray, Purvis, & McCray 2002) , problem complexity (Simons & Thompson 1998) and escalating commitment (McCray, Purvis, & McCray 2002; Nulden 1996). It is the opinion of some authors (for example Buss (1987), Mintzberg (1972)) that information concerning potential intangible benefits can be more important than other tangible factors when making a decision.

However, Buss (1987) also noted that tangible factors such as financial benefits, business objectives, and technical importance were common information justifications. The OASIG report (1996) supported this by stating that the most common justifications for the implementation of new technology were cost reduction, increased output, improved quality and reliability, and innovation in products and processes. Of these, the OASIG report (1996) noted that cost reduction was the most commonly used. This is noteworthy given the high rate of budget over-run and project abandonment in IS projects.

2.5.2 Contextual factors

As discussed previously, there are many contextual factors that affect the way in which an organisation approaches the decision making process. These contextual factors do not necessarily have a direct influence on the outcomes of decisions but may instead act on the information that is being fed into the process, as described in section 2.4.3 (see page 28). For example, the contextual influence of core business or organisational focus

will determine which pieces of information are acknowledged in an evaluation or justification process (Brindle 1999; O'Reilly 1990). Given the important effects of context on decision making, this section explores and categorises contextual factors in detail.

Child (1987) identified a number of organisational factors that affect capital investment decisions relating to innovation. These included organisational inertia, labour skills,

organisational culture, power structures and social or organisational norms.

Organisational design and the ability of the organisation to change also have a direct influence on decision making (Ozsomer, Calantone, & Di Bonetto 1997; Sarkis & Sundarraj 2000). Other common contextual influences on decision making include organisational resource levels (Arias-Aranda, Minguela-Rate, & Rodriguez-Duarte 2001), organisational structure (Gallivan 2001; Karake 1994), the ability of the organisation to access information (O'Reilly 1990; Verville & Halingten 2002) and the level of uncertainty surrounding the information or decision (Buchanan & Kock 2000; Chan 2002a). It is the combination of these contextual factors, information and the decision process that lead to decision outcomes.

Three inter-related dimensions affect the context in which decisions are made:

1. ***What are the attributes of the organisation making the decision?*** What is the size of the organisation? What does it do? What resourcing does it have? What type of politics and relationships exist internally and externally? What is the culture of the organisation?

2. ***Where is the decision made?*** Who makes the decision? Who owns the organisation? How does the organisational structure affect access to the decision making?
3. ***How is the decision made?*** What models are used? Who gets to choose which information is accepted and discarded? Where is information sourced from? How much information is available?

It can also be argued that time forms another dimension to this construct in the sense that a decision outcome may be affected by *when* the decision is taken. While time does play a role, its influence is more likely to be seen in how the decision is made, for example, in a rushed way. Its influence may also be seen in what type of relationships exist with other organisations and the influences of fads and fashion (OASIG 1996). As such, time is not explicitly considered in this review. Within these contextual dimensions, there are a number of organisational decision factors. These have been summarised from the literature and are presented in Table 2-2. The dimension classifications of what, where and how are those described previously.

Analysis Factor	Dimension	Reference
Levels of employment	What	On number of employees: Arias-Aranda, Minguela-Rate, and Rodriguez-Duarte (2001). On information sources: Verville and Halingten (2002), Child (1987) and Cannon (1994)
Level of adaptability/flexibility	What	Ozsomer, Calantone, and Di Bonetto (1997), On innovation: Sarkis and Sundarraj (2000)
Organisational structure	Where	On where the decision is made: Karake (1994), Gallivan (2001), OASIG (1996) and Basi (1998)
Ownership	Where	Karake (1994) and OASIG (1996)
Knowledge base and level of expertise	What	On the move towards outsourcing: Lin and Pervan (2001). On in-house development: Myers (1994a). On organisational knowledge: March and Simon (1958)
Level of expenditure or income	What	On the use of revenue as a size measurement: Schroder and Sohal (1999). On turnover affecting innovation: Arias-Aranda, Minguela-Rate and Rodriguez-Duarte (2001)
Accessibility to information	How	On information processing: Verville and Halingten (2002), O'Reilly (1990). On information sources and richness: Daft and Lengel (1990)
Agreements with external organisations	How/ What	Sarkis and Sundarraj (2000). On access to information: Daft and Lengel (1990)
Industry or purpose of the organisation	What	On the Television New Zealand implementation: Myers (1994a)
Time taken to make decision	What	Verville and Halingten (2002) and Sarkis and Sundarraj (2000)
Culture	What	Gallivan (2001) and Child (1987)
Organisational power structures	Where	O'Reilly (1990). On evaluations subject to power: Hirschheim and Smithson (1987) and Marcus (1983)
Group norms	What	On culture: O'Reilly (1990)
Organisational incentives	How	O'Reilly (1990). On status: Hirschheim and Smithson (1987)
Organisational goals	How	On profit and cost margins: O'Reilly (1990)
Organisational control systems	How	On feedback systems: O'Reilly (1990)
Communication	How	O'Reilly (1990)
Politics	What	Hirschheim and Smithson (1987), Marcus (1983), Myers (1994a), OASIG (1996) and Yourdon (1997)
Organisational use of evaluation Models	How	OASIG (1996)
User involvement in evaluation process	Where	OASIG (1996)
Levels of information and uncertainty	How	Buchanan & Kock (2000) , Chan (2002a) , Grise and Gallupe (2000) and Iselin (1993)

Table 2-2 Summary of the contextual factors affecting decision making

2.5.2.1 The *what* dimension

The most prominent factor associated with the *what* attributes is that of size. Goode (2002) suggests that there is disagreement in the literature as to what constitutes organisational size. His findings from a survey and analysis of 2000 journal papers showed that many studies offer little or no supportive analysis or justification for their use of organisational size. Furthermore, he identifies twenty-one separate factors that authors related to organisational size. As such, it is meaningless to simply refer to organisational size as an organisational decision-affecting factor without qualifying what size is. Without declaring what is meant by size, the conclusions drawn and scientific approach taken may be undermined (Goode 2001).

Arias-Aranda, Minguela-Rate and Rodriguez-Duarte (2001) found that the size of a firm, measured by turnover, will affect the level of innovation but that the size of a firm, measured by employees, may not affect the level of innovation. Schroder and Sohal (1999) found that organisational size as measured by revenue will affect where technology adoption decisions are made. Their findings indicate that larger organisations allow the decisions to be taken at senior management levels whereas smaller organisations will have a higher level of senior management or owner involvement. Their findings also indicate that there is a relationship between the time taken to invest and the time taken to implement the project: the larger the company, the longer the decision process takes and the longer the implementation time (Schroder & Sohal 1999). Yet this does not have a direct bearing on the actual factors that drive the decision process so further research is required.

Sarkis and Sundarraj (2000) found that the reason, or drivers for, adopting technology are affected by organisational size. Furthermore they indicated that organisational size, in the form of time and money, would directly affect the ability to produce the data

required to generate complex evaluation models. They indicated that the lack of in-house expertise in developing, applying and interpreting evaluation techniques may also determine which would be most appropriate (Sarkis & Sundarraj 2000). Lin and Pervan (2001) noted that organisations who had outsourced their IS staff were left with limited internal expertise and had to rely on external opinions for their IS requirements and evaluations. Therefore, an organisation's external relationships have a direct bearing on its decision making process. For example, an organisation with limited external relationships may not have the necessary information sources from which optimal decision can be made. Internal organisational relationships also play a role in decision making. O'Reilly (1990) suggests that decision makers will choose information from sub-units within an organisation based on trust. Thus information can be accepted purely on existing relationships that deem a source as trustworthy. In earlier studies March and Simon (1958) found that the level of organisational experience and knowledge had an effect on the level of uncertainty in organisational decision making. They found that those organisations with extensive organisational memory or experience have lower levels of uncertainty in their decision making. Such contextual factors relate to the levels of organisational knowledge and accumulated wisdom which in turn have effects on decision outcomes.

Other attributes exhibited by organisations such as purpose, culture and organisational goals also affect decision makers. As O'Reilly (1990 p. 100) noted:

Decision makers are usually constrained first by the nature of the job, that is organisational or sub-unit goals are imposed along with the responsibility to work toward attaining these goals.

A number of authors (see for example Markus (1983) and OASIG (1996)) have noted the role of politics in organisational change and the decisions affecting IS. Markus

(1983) noted that information systems frequently embody a distribution or inter-organisational power among key actors. As such, the selection and implementation of information systems can be heavily affected by such influences. However, the degree to which politics interacts with other informing factors and its effect on organisational outcomes is uncertain.

2.5.2.2 The *where* dimension

Organisational structure will have effects on how innovative an organisation is (Gallivan 2001). Ozsomer et al. (1997) found that organisations are more likely to be innovative if they have a flexible structure and are proactive. Thus an organisation's structural ability to adopt and implement change will positively bias decisions involving radical change and innovation. An organisational preparedness to seek out solutions to operational issues and problems can also motivate decisions to proceed with new projects.

Karake (1994) examined IS structure within organisations and how the structure was affected by organisational ownership. Karake's findings indicated that managers who had a high proportion of equity exercised tighter control over company operations and as a consequence, had a tendency to centralise the IS function. There was also evidence to suggest that larger organisations do not centralise their IS decisions, for example, decisions relating to IS appear to occur across organisational business units (Karake 1994). Hann and Webber (1996) used surveys to examine management decision making and delegation in the face of uncertainty relating to IS. While their results were mixed, they found that senior decision makers were less likely to delegate decision making rights relating to IS in the face of uncertainty. However, at the same time, senior decision makers were often less involved in IS project planning processes. In other words, senior decision makers deferred the planning to junior managers but made the major decisions themselves.

Basi (1998) extended the contextual aspect of where a decision is made by arguing that this dimension also affects how a decision is made. He noted that decisions are made differently at different levels of organisations. He argued that *where* and *how* a decision is made are determined contextually by organisational culture.

2.5.2.3 The *how* dimension

It is often assumed that rational decision makers seek out unbiased information relating to decisions and from this, weight the information according to organisational goals (O'Reilly 1990). However, as previously discussed in section 2.4.3 (see page 28), decision makers are subject to a number of biases and restrictions including information bias, information overload and uncertainty. O'Reilly (1990) also suggested that organisational control systems affect the way in which decisions are made and information gathered. Control systems provide feedback and sanctions to focus attention on achieving certain ends (O'Reilly 1990). The organisational processes in place may bias those in the decision making role. For example, if decision making members of an organisation perceive that an organisation wants to adopt a particular technology and they are aware of previous examples of employees not recommending the preferred option being 'punished' (the feedback system), then they are likely to provide biased information or recommendations to their managers (O'Reilly 1990). Thus data that would support the preferred outcome is sought while other information is ignored. Decision makers are likely to use information if it is supportive of the outcomes favoured by decision makers, does not lead to conflict and cannot be attacked (O'Reilly 1990).

While this demonstrates the bias in factor selection, it does not fully explain why the factors were perceived as reinforcing the preferred outcomes or why the original outcome or preferred decision was reached. It is also important to note that while decision makers may attempt to obtain more information than they can actually use, the

result of this may be that decision makers arrive at poorer decisions, but have a higher confidence in them (O'Reilly 1990).

2.5.3 Relationships between factor acknowledgement and decision outcomes

Some case studies have noted IS project decisions where factors were not explicitly acknowledged in decision justifications (see for example Davis et al. (1992), Myers (1994a; 1994b), Ramiller (2001) and Heracleous and Barrett (2001)). For the purposes of this research, these factors are termed undisclosed factors. Undisclosed factors are defined as factors that cannot be explicitly acknowledged in a decision justification due to their intangibility, uncertainty or the political risk and ramifications involved in their disclosure. This definition does not exclude the possibility that undisclosed factors can be tangible. However, if there is an associated risk or ramification in disclosing the factor, it may remain undisclosed. For example, an opinion of an external body or individual containing tangible information may have an influence on a decision maker. However, because the source may not be trusted or shared with other decision makers, it may remain undisclosed.

From the literature, it appears that justifications generally only exhibit characteristics of certainty and measurability (Heracleous & Barrett 2001; Myers 1994a; Myers 1994b; Myers & Young 1997; Ramiller 2001). There are indications that by not disclosing all decision factors in justifications, the role of other factors appears to change. Tangible factor importance may be enhanced; factors and evaluation processes maybe justified to retrofit the decision and risk perceptions may be altered. Organisational factors like core business, organisation objectives and goals may be promoted and there is some evidence that intangibles, such as perceived benefits, are given priority and are made to seem less intangible (Myers 1994b).

There are indications that substitute or proxy factors may be used in justifications. If a decision factor exhibits characteristics of uncertainty but supports a decision aligned with organisational goals and objectives, it is more likely to influence the decision but will be justified by other *proxy factors* that are perceived as more solid (Jamieson & Hyland 2004b).

This lack of decision making transparency is concerning given the IS implementation failure rate (see section 2.2.1, page 14). Many decisions have been made based on faulty justifications (Heracleous & Barrett 2001; IT Cortex 2002b; Myers 1994a; Myers 1994b; Myers & Young 1997; OASIG 1996; Ramiller 2001; Standish Group 1995). However it is clear that many of these justifications are unrelated to the real decision factors.

Organisations continue to use the same decision processes and produce the same type of justifications even when IS projects continually fail. Even if implemented, their long-term organisational effects are often clearly negative (see for example Lerach et al. (2000), Rutti (2000) and Laudon and Laudon (1996)), undermining the legitimacy of the IS decision justifications.

One such example was reported by Oliver and Romm (2002) who described how an ERP was adopted by a medium-sized educational organisation. In their paper, they describe how there was evidence of previous failed implementations of the ERP at other organisations. They indicated that there had been well publicised legal action against the ERP vendor (Lerach et al. 2000; Rutti 2000) for faulty software, and evaluation team site visits to other implementing organisations indicated excessive implementation problems. There were also concerns regarding technical and feature issues in gap analysis and a lack of onsite technical expertise. However, as other organisations with the same core business were implementing ERPs, there was a perceived need for organisational process change. There was also a potential for cost saving in IS and administrative infrastructure over the long-term. The ERP was adopted with the

justification that it would save the organisation money over an extended period of time, would enhance the strategic position of the organisation and lead to process change (Oliver & Romm 2002). Technical risk, previous implementation history and technical recommendations were factors that appeared to have been discounted in the final decision yet perceived benefits like cost saving and process change were amplified. The organisational outcomes were budget and implementation time over-run, limited organisational process change and high ongoing support, technical and administrative costs. In the light of these negative outcomes, the implementation would be classified as a failure (IT Cortex 2002d; Mahaney & Lederer 1999; Standish Group 1995). Strikingly, the justifications used for the decisions were proved to be flawed. This case raises the question: why were other decision factors not considered?

It has been noted in some IS decision making, factors that are not acknowledged in justifications may be compensated for with other justifications (Heracleous & Barrett 2001; Myers 1994a; Myers 1994b; Myers & Young 1997; Ramiller 2001). Undisclosed factors that support the decision, but cannot be used, may result in other proxy justifications. Undisclosed factors can remain obscured or be explicitly countered by other justifications. Failing to disclose all factors results in a lack of decision making transparency and creates a false sense of security. This lack of transparency may lead to negative outcomes for organisations (Heracleous & Barrett 2001; Myers 1994a; Myers 1994b; Myers & Young 1997; Ramiller 2001). The lack of transparency and understanding of IS decision making highlights a gap in the literature requiring further investigation. The actual decision factors, how they interact and what effects they have on outcomes are unknown. In order to investigate this problem, a greater understanding of why factors are not disclosed needs to be achieved. This research will examine this issue.

2.6 Decision versus implementation

From an operational sense, implementation is the act of designing, coding, testing and rolling-out a system as the result of IS project decisions (Murch 2001; Page-Jones 1988).

It can be seen that while the implementation of IS decisions affects IS project outcomes, a great deal is still unknown as to how these decisions are reached in the first place.

There is great level of uncertainty as to why decisions are taken and how organisations can be sure they made the correct choices. Does the prevalence of IS project failure simply relate to the fact that poor decisions were taken in the first place?

From the failure factors discussed in section 2.2.3 (see page 17), it appears that some IS projects are destined to fail due to the initial decisions taken to proceed with the project, the selection of the systems and the implementation decisions. Often decisions to implement technology are taken simply because competitive and institutional pressures do not allow for delaying the decision until more information can be gathered (Ramiller 2001). Failure is also compounded by post-implementation decisions.

Failures of IS are rarely the result technical issues in isolation (OASIG 1996). The analysis, software design and coding processes can be tested and verified during the implementation. Thus, as individual elements, these cannot be solely attributed to project failure. However, when quality is compromised and invalid information and guesswork are introduced, the misapplication of such elements can hardly be blamed for the eventual failure of the system. Furthermore, if the development and execution of systems are performed under tight time and budgetary constraints, the first thing to suffer is quality of the system: this is itself a decision within the implementation leading to system failure.

There are a number of decisions taken before, during and after an IS implementation that can also be related to documented causes of success and failure (Davis et al. 1992; Reel 1999; Standish Group 1995). The traditional IS project phases of planning, analysis, design, construction, testing and rollout (Murch 2001; Mynatt 1990; Senn 1989) involve decisions that can be broadly grouped as pre-implementation, implementation, reactive implementation and post-implementation decisions. Each of these phases impacts on project outcomes. These decisions are discussed in this section and an argument is made that poor pre-implementation decisions lead to IS project failure.

2.6.1 Pre-implementation decisions

Pre-implementation decisions relate to the organisational strategy to adopt and implement some form of IS (Murch 2001; Senn 1989). These types of decisions are based on an organisation's need for the technology, what the technology must be able to deliver, which system is appropriate, how the system will be implemented, who will guide the implementation process and the projected budget (Murch 2001; Senn 1989) (see Table 2-3). These are critical decisions: all of these decisions have a direct effect on the implementations and outcomes for the organisation.

Decision	Description
Decisions to proceed	Justification based on business goals, potential profit and cost savings
Decisions relating to specification	What are the perceived needs of the organisation and system?
Decision relating to system selection	Which system is appropriate for the organisation and specification?
Decision on implementation methodology	How will the system be implemented and by whom?
Decision on time and budget	What is the budget for the system purchase and implementation and what is the time required to implement? This decision may occur before many of the other decisions.
Governance decisions	Who will make decisions relating to the implementation and selection of the system? What power do they have?

Table 2-3 Pre-implementation decisions

2.6.2 Implementation decisions

Implementation decisions (see Table 2-4) are those directly associated with implementing the systems and maintaining control of the project. They are usually made during, under traditional software implementation methodologies, the design and construction phases of IS projects (Murch 2001; Senn 1989; Yourdon 1997). While these decisions may be made at a high level of the organisation, they often deal with issues that have direct effects on operational implementation issues. As described in Table 2-4, decisions such as those surrounding the type and size of the infrastructure purchased will directly affect the performance of the system.

Decision	Description
Technical and infrastructure decisions	What infrastructure is required to support the system and what type of tools will be required? What elements of the system will be modified and how?
Staffing decisions	How many and what type of staff are required?
Specification and analysis gathering decisions	What further information is required and from whom? Who will gather the information? How will this be fed into the system implementation and design?
Implementation governance decisions	What features will be kept in the systems? What features will be added or dropped based on the gathering of information requirements? Who makes the final decision?

Table 2-4 Implementation decisions

2.6.3 Reactive implementation decisions

Reactive implementation decisions (see Table 2-5) are made when problems arise with project implementation and often occur during the construction and testing phases (Murch 2001; Senn 1989; Yourdon 1997). The requirement for these decisions occurs as the result of previous poor planning or decision making. However, reactive implementation decisions can result from other unplanned events such as staff

resignations, changes from software vendors and physical systems failure (Yourdon 1997).

Decision	Description
Response to system not meeting requirements	What features will be added “in-house” and who will do these?
Response to time and budget creep	What features/hardware/resources will be cut? Will budget/time have to increase?
Response to initial technical and infrastructure failings	Will additional hardware be purchased? What can be done to fix the technical issues?
Response to requirements changes	Will new requirements be incorporated and at what cost?
Continuation and resource investment decisions	Does the implementation continue or should it be abandoned? If continued, what additional resources will be required?

Table 2-5 Reactive implementation decisions

2.6.4 Post-implementation decisions

While decisions made before and during a system’s implementation have the most effect on organisations, the decisions made after the implementation dictate some of the long-term organisational outcomes. These decisions usually occur during a post-implementation evaluation (Murch 2001; Senn 1989). Decisions, such as those described in Table 2-6, affect the way in which a system is used and accepted by the organisation. These decisions also determine if the organisation will seek to improve decision making processes in future projects.

Decision	Description
Abandonment or re-implementation decisions	Should the implementation be abandoned or should a “fix” implementation occur?
Implementation review decisions	Should a formal implementation and decision audit occur?

Table 2-6 Post-implementation decisions

2.6.5 Decisions that cause failure

Information systems project failure appears to be caused by the decisions made regarding the adoption, selection and implementation of systems rather than the mechanics of implementation: individuals or groups of individuals within organisations make these decisions. Reel (1999) noted that people consistently make bad decisions in

selecting technologies and that smart decisions often avoid project failure. An a priori construct used to guide this research (see Table 2-7) describes relationships that may exist between the decisions taken before a system is implemented and the causes of project failure as discussed in section 2.2.3 (see page 17). These pre-implementation decision-failure relationships are yet to be empirically tested and may be observed as part of this research.

Decisions	Factors																	
	Inappropriate personnel/lack of expertise	Incomplete requirements	Ineffective control measures	Lack of executive support	Lack of IS management or leadership	Lack of planning	Lack of quality control	Lack of resources	Lack of user involvement	Over emphasis on organisational cost	Poor communication	Poor project management	Poor risk management	Project size	Technology illiteracy	Technology no longer required	Unclear objectives/inadequate definition	Unrealistic expectations
Implementation	✓	✓		✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓
Time and budget		✓	✓		✓	✓	✓			✓	✓	✓	✓	✓		✓	✓	✓
Systems selection	✓	✓						✓	✓			✓	✓	✓	✓	✓	✓	✓
Specification	✓				✓		✓		✓			✓	✓	✓	✓	✓	✓	✓
Initiation									✓		✓	✓	✓	✓	✓	✓	✓	✓
Governance	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Table 2-7 Decision and failure causal relationships

Using this construct, it is possible to examine cases of IS failure and relate them back to the decisions made. For example, a small unit within a large Australian government department responsible for providing a simulated training and evaluation environment was tasked with modelling a piece of hardware and its interaction with a simulated environment (Ashton, August 1999, pers. comm.). The relevance of the hardware interaction was limited, but the decision to model the interaction was made on the grounds that it would demonstrate the modelling capabilities of the unit. Organisationally, it was believed that this would facilitate a stronger political and

financial position for the unit. During the implementation of the simulation, the programmers investigated the capabilities of the real hardware and it was found that the interaction with the simulation environment would be of little value to the users. A decision was made by the senior managers to alter the characteristics of the simulated hardware so that it interacted more meaningfully and observably with the environment. The final product operated in a completely fictional way and had no relevance to the real hardware that it was intended to model. The users rejected it and the project was, if assessed using Delone & McLean's (1992) IS success model, a failure.

The known failures (see Table 2-1, page 18) that resulted from pre-implementation decisions made in the project were:

1. Failure: Technology no longer required or has changed
Decision: Model the hardware with limited value
2. Failure: Lack of user (expert) involvement
Decision: Ignore actual characteristics
3. Failure: Technology illiteracy
Decision: Ignore actual characteristics
4. Failure: Unrealistic expectations
Decision: Initiate implementation and alter simulation characteristics
5. Failure: Lack of IS management or leadership
Decision: Initiate implementation and alter simulation characteristics

These failures ultimately impacted on the outcome of the project and were the direct result of pre-implementation decisions.

Decision makers have been criticised for their emphasis on cost reduction (OASIG 1996). This focus can lead to very poor decisions. For example, the client of a large IS outsourcing company requested a proposal for the establishment of a centralised database for the collation and analysis of commodity information (Jamieson, February 2000, pers. comm.). The client was a semi-government owned company that had very little internal IS expertise. While the initial specification was vague, the IS outsourcer provided the client with the best technical and cost analysis options available. The client rejected the proposal stating that the hardware platform chosen for the database was too expensive. The client then produced a counter proposal with a hardware platform that was aligned with its corporate infrastructure policy and was cheaper. After repeated attempts to convince the client that their preferred hardware platform would not scale or perform, the IS outsourcing company finally complied and implemented the system on the client's platform. The system failed repeatedly and the replacement system eventually cost the client twice that of the original proposed system. The project was deemed a failure by the client and outsourcer. The known failures (see Table 2-1, page 18) that resulted from pre-implementation decisions made in the project were:

1. Failure: Unclear objectives/inadequate definition
Decision: Provide limited specification
2. Failure: Over emphasis on organisational cost reduction
Decision: Specify preferred hardware based on cost
3. Failure: Technology illiteracy
Decision: Specify preferred hardware based on non-technical justifications because of technological incompetence
4. Failure: Inappropriate personnel (making the decisions)
Decision: Proceed with implementation of inferior, ill-equipped hardware based on the decisions of people with a poor understanding of the technology

Failure: Unrealistic expectations

Decision: Proceed with implementation of inferior, ill-equipped hardware that could never technically meet the requirements

5. Failure: Lack of IS management or leadership

Decision: Proceed with implementation of inferior, ill-equipped hardware due to the poor IS leadership of the management

It can be seen from the previous examples that there is a direct relationship between pre-implementation decisions and IS project outcomes. It can also be seen that a number of factors, some of which are undisclosed, affect decision makers. It is the purpose of this research to identify factors that affect pre-implementation decisions. The research aims to build an understanding of the relationships between decision factors and decision outcomes, both from a project and organisational perspective.

2.7 Conclusion

This section has provided an overview of the failure rates affecting IS projects and the known failure causes described in the literature. It has been argued that IS evaluation processes and practices are often non-structured and only provide an illusion of rationality to decision making. Conventional decision making theory was described and broad classifications of rational and judgement decisions were explained. The effects of information bias, cognitive biases, risk and uncertainty on decision making was explored. After describing conventional organisational decision making models, it was proposed that the models suffered from a number of limitations. An alternative contextual decision making model has been developed, providing a theoretical framework for this research. This chapter has explored the literature detailing the interaction between information, context and factor acknowledgement. An argument was made that decision making has equal if not more effect on project outcomes than implementation issues. From this basis, this research will explore the information and

contextual factors that affect pre-implementation IS decision making and what relationships these have with decision outcomes.

Chapter 3

Methodology

3.1 *Introduction*

The previous chapter identified a gap in the literature concerning which factors affect information systems (IS) pre-implementation decisions. Furthermore, little was known about how these factors affect decision outcomes. This chapter describes the research method used to acquire and analyse data in order to address these issues. The chapter begins by establishing the framework in which this research occurred. From this, the research question and sub-questions are defined. The interpretive case-study research design is then described and justified. The chapter then details the research data sources and how data was collected. A discussion of the research design is followed by the justifications for the technique used. Data gathering techniques are then detailed followed by a description of the analytical technique used to describe and explain research outcomes. The hermeneutic understanding and theory building data analysis technique is then described, followed by the principles and strategies used to maintain research integrity. Finally, limitations and ethical issues are identified.

3.2 *Theoretical framework*

From the literature review in chapter two, it is evident that this research encompasses a number of research disciplines as described in Figure 3-1.

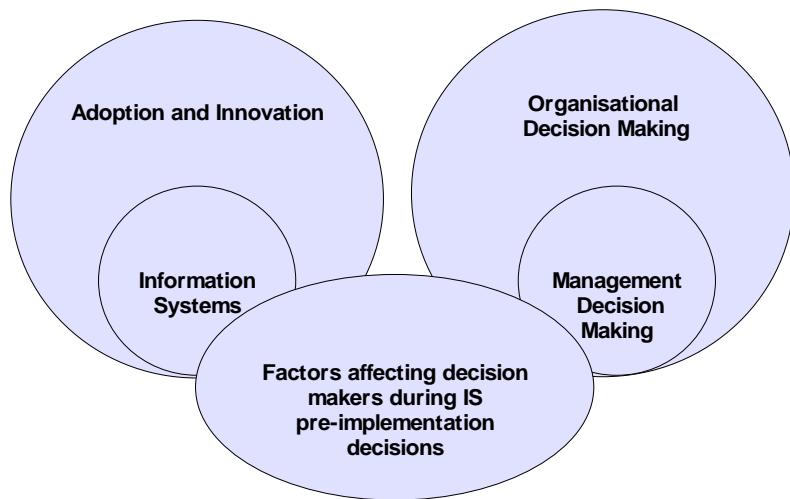


Figure 3-1 Research focus

In developing this study, it was clear from these informing bodies of literature that there is a high incidence of failure in IS projects. While prior literature focused on implementation factors associated with project failure, there had been little research into pre-implementation activities and their impact on outcomes. An a priori theory construct that underpinned the exploratory and descriptive nature of this research was that IS project pre-implementation decisions affect organisational outcomes, yet little was known about the factors that influenced these decisions.

While prior literature described the effects of contextual factors on general IS decision making, a gap was identified in the understanding of the behaviour of tangible and intangible informational factors and their effects on IS project pre-implementation decisions. It was not known if, how and why such factors affect decision outcomes. Moreover, it was not known how or why contextual factors interact with informational factors and if they had any influence on decision outcomes.

The focus of this research was drawn from research in information systems, adoption and implementation, management decision making and organisational decision making. This research examined the factors affecting pre-implementation decisions relating to

information systems adoption and selection within the contextual decision making model depicted in Figure 2-4.

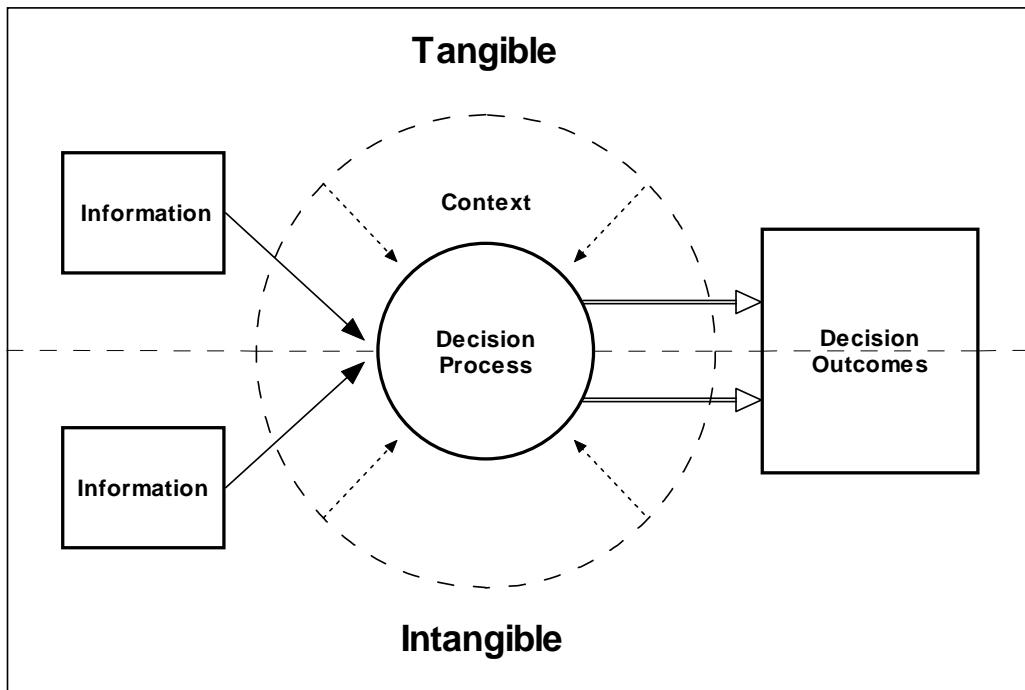


Figure 2-4 Contextual decision making model

Using this research model, it was proposed that decisions occur based on a combination of tangible and intangible factors. These factors consist of information and the context in which decisions are made. The input variables consist of the variables of tangible and intangible information and contextual factors. These factors have a relationship with the tangible and intangible decision outcomes. The aim of this research was to build a rich understanding of these the relationships through factor identification and theory development.

3.3 Research questions

This research focused on factors affecting IS project pre-implementation decisions and their relationships with decision outcomes. The primary question addressed by this research is:

What tangible and intangible information and contextual factors affect decision makers when making IS project pre-implementation decisions and how do these affect decision outcomes?

Eisenhardt (1989) noted that a recognition of a priori constructs helped guide understanding and theory building. These constructs are derived from the literature review and shape the design of the research. They provide avenues of investigation in order to address the main research problem. It is important to note that these constructs are tentative and may not exist or be of importance in any resultant findings or theory. This research was underpinned by constructs derived from the theoretical framework which are expressed in the research sub-questions. The sub-questions are:

1. *When making pre-implementation IS decisions, what are the tangible and intangible informational factors used by decision makers? How do these informational factors affect decision makers and decision making?*
2. *When making pre-implementation IS decisions, what tangible and intangible contextual factors affect decision makers? How do these contextual factors affect decision makers and decision making?*
3. *Are all decision making factors formally disclosed in decision justifications? If factors are not formally disclosed in justifications, what are their characteristics? Are there relationships between factor tangibility and disclosure? Do undisclosed factors have a greater influence on decision makers than disclosed factors?*

4. What relationships exist between the decisions made in the pre-implementation phase of an IS project and the organisational outcomes? Are there relationships between decision factors and decision outcomes?

3.4 Research design

This research is a qualitative study into factors that affected IS decision making.

Qualitative research is a descriptive and interpretive method of gathering and analysing data. The focus of qualitative research is to find the meaning of data, where the researcher's role is that of an interpreter (Gillham 2000). The dependent variables for this research are the adoption and selection decision outcomes from decisions taken in IS projects. The independent variables are the tangible and intangible factors that affected decision making during the adoption and selection of IS.

Using Sekaran's (2003) model of research design, the following design decisions were taken. The purpose of the research was both exploratory and hypothesis building, also known as exploration and explanatory research (Yin 1994). The aim was to develop deep understanding of the phenomena examined as well as the development of broader theory. The research examined the relationships between decisions and influencing factors and outcomes. In particular, it described the relationships between particular factors or interactions between factors and decision outcomes. The research was conducted as non-contrived comparative studies where the unit of analysis is organisations. The study was cross-sectional and data was gathered from four case studies. Within the case studies, semi-structured interviews were used as the primary information gathering tool with documentation and direct observation providing additional information. This design was chosen so as to use the semi-structured interviews to provide exploratory and descriptive data within the case studies and give both breadth and depth to the data gathering.

3.5 *Design justification*

In this section, the main research decisions are discussed and justified. The section begins with a discussion of the interpretivist research approach. It then addresses the selection and use of a multiple case study methodology. Finally, the number of cases and issues of generalisability are discussed.

3.5.1 Interpretivist approach

While there is a historical preference for positivist research methods in IS (Harvey & Myers 1995), this research has used an interpretive approach. Information systems research that gains knowledge from the reality of social constructions such as consciousness, language, shared meanings, symbols, stories, documents, interviews and other interactions can be classified as interpretive (Boyce 1996; Klein & Myers 1999). Interpretive research assumes that in order to understand, we must interpret (Rhodes 1997). While positivist methodologies focus on formal theories and quantifiable measures, interpretive research is interested in context and the way in which it influences processes and outcomes. IS research using interpretive research methodology has emerged as a valued and important alternative to the more traditional positivist and critical theory approaches (Harvey & Myers 1995; Klein & Myers 1999).

Information systems projects involve complex interactions between people, technology, politics and other organisational factors. As Myers (1994a) argued, an IS project is primarily a social process. This process is dynamic and is difficult to model or understand using traditional positivist approaches (Myers 1994a). This is because positivist approaches often attempt to develop fixed, predictive relationships and elements. Positivist approaches model how things work, not necessarily why or in what context (Myers 1994a). Therefore, it was inappropriate to use a positivist model to research decisions that were subject to socio-political complexities. In order to build a

deep understanding, it was important to use an approach that fully integrated contextual information and the ability to treat each individual case as its own phenomenon.

3.5.2 Case study method

Data for this research was collected from multiple cases studies. Yin (1994 p. 23) defined a case study as:

An empirical inquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used.

Eisenhardt (1989 p. 546) described the advantages of using case studies to build understanding and theory:

Although a myth surrounding theory building from case studies is that the process is limited by investigator's preconceptions, in fact, just the opposite is true. This constant juxtaposition of conflicting realities tends to "unfreeze" thinking, and so the process has the potential to generate theory with less researcher bias than theory built from incremental studies or armchair, axiomatic deduction.

Case studies provide a method for investigating complex social phenomena, such as decision making, that can encompass holistically many aspects and characteristics of real-life events (Yin 1994). Benbasat, Goldstein and Mead (1987 p. 370) provided further clarification in their definition:

A case study examines a phenomenon in its natural setting, employing multiple methods of data collection to gather information from one or a few entities (people, groups or organisations). The boundaries of the phenomenon are not clearly evident at the outset of the research and no experimental control or manipulation is used.

In qualitative research, case studies allow examination of a small number of sites that can produce rich and highly descriptive detail. Apart from their exploratory value, case studies provide a platform for theory building (Eisenhardt 1989) and are useful for identifying key events and actors and linking them to a causal chain (Benbasat, Goldstein, & Mead 1987).

As a research methodology, case studies have been used to research areas as diverse as psychology, sociology, economics, information systems and management (Yin 1993; Yin 1994). Yin (1994 p. 20) stated that ‘the case study’s unique strength is its ability to deal with a full variety of evidence – documents, artefacts, interviews and observations’. Case studies are useful in answering the *what, how and why* questions in exploratory research (Yin 1994). In this research, these questions are applied to the factors that affect decision making.

Benbasat, Goldstein and Mead (1987 p. 370) described three reasons why case study research is particularly appropriate for IS:

First, the researcher can study information systems in a natural setting, learn about state of the art and generate theories from practice. Second, the case method allows the researcher to answer “how” and “why” questions, that is, to understand the nature and complexity of the processes taking place. Questions such as, “How does a manager effectively introduce new information

technologies?” are critical ones for researchers to pursue. Third, a case approach is an appropriate way to research an area in which few previous studies have been carried out.

In this research, all three conditions for case study research have been met. Firstly, it was important to capture the contextual issues surrounding IS pre-implementation decisions by observing practice. Secondly, the focus of this research was on *how* and *why* critical pre-implementation IS decisions are made. Thirdly, little research had been conducted into how IS decisions occurred, what factors were used and how these affected decision outcomes.

3.5.3 Number of cases and generalisability

Yin (1994) contended that multiple case studies provide more compelling and robust evidence and enhance the generalisability of research. Miles and Huberman (1994) agreed and argued that an increased number of case studies deepens the understanding and explanation of a problem. Deciding how many cases are appropriate to examine entirely depends on the research aims and the point at which theoretical saturation is reached. For example, Eisenhardt (1989) argued that understanding and theory generation can be achieved by examining as few as four cases and that additional cases are not required once theoretical saturation is reached. Other authors, such as Benbasat, Goldstein and Mead (1987) have observed that quality, rich IS research can be achieved with as few as two cases. The research undertaken for this thesis is interpretivist and does not aim for positivist statistical validation. It aims to elicit deep understanding of phenomena and theory building from descriptive empirical data. This research does not claim statistical generalisability.

The issue of generalisability is controversial, especially in qualitative case studies. Lee (1989 p. 41) stated that ‘generalizability is a quality describing theory that has been

tested and confirmed in a variety of situations'. Generalisability is a key tradition of the positivist movement; however it has received little emphasis within interpretivist research (Lee & Baskerville 2003). This is primarily because interpretivist research does not insist on one objective truth, acknowledges phenomena occur and seeks to describe them in order to build understanding and theory. Only later can theory be tested using rigorous statistical methods. Lee and Baskerville (2003 p. 240) added that 'A theory may never be scientifically generalized to a setting where it has not been scientifically tested and confirmed'. Moreover, increasing the sample size or the number of sites in a multiple case study is not an indicator of greater generalisability of theory to new settings (Lee & Baskerville 2003).

As such, Lee and Baskerville (2003) criticised beliefs that increasing the number of empirical observations by conducting a higher number of cases studies would increase statistical generalisability. For this to apply, Lee and Baskerville (2003) argued that there would have to be uniformity in nature. Lee and Baskerville (2003) argued that this assumption is the same as believing that the future will always be like the past. In an imperfect world subject to contextual influences, this is impossible. However, Lee and Baskerville (2003) contended that theory can be generalised from descriptive empirical observations, confirming the beliefs of such authors such as Klein and Myers (1999) and Eisenhardt (1989). This theoretical abstraction is referred to as generalising from description to theory. They noted that:

Criticisms that case studies and qualitative studies are not generalizable would be incorrect ruling out generalizability of empirical descriptions to theory. Furthermore, such criticism could be incorrectly presuming that statistical generalizability is the only form of generalizability (Lee & Baskerville 2003 p. 237)

As such, theoretical generalisability can be achieved from one or more case studies and generalisability is not increased by increasing the number of sites. This research aimed for an interpretivist theoretical generalisability rather than a positivist statistical generalisability. As such, in this instance it was not appropriate, or required, to use a large sample size, especially given that theoretical saturation was reached after four detailed cases.

3.6 Data sources

Research was conducted in organisations whose size could be classified as larger than a small to medium sized enterprise (SME). Organisations were selected if their core business was not directly related to IS product or service provision. These organisations provided a greater scope to collect data from a wider range of employees involved in all levels of the decision making processes. Organisations were selected from different industries and sectors to provide a breadth of contextual backgrounds.

Organisations were selected that had recently introduced new information technology or systems that required a selection and implementation project. The projects were significant in cost and organisational impact and formed part of the organisation's core business support or internal data management. Projects included the selection and implementation of outsourcing agreements, data warehouses, health care systems, network infrastructure and enterprise resource planning (ERP) systems. Selected IS projects were sponsored or coordinated by senior management. IS adoption and implementation decisions extended beyond the IS department or group level had either management or user input. Within organisations, data sources included documentation, archival records, interviews, and direct observations. Use of these multiple sources of evidence assisted in the triangulation of conclusions and the corroboration of theory developed. According to Yin's (1994) work, this triangulation added to the construct validity of this research.

A purposive sampling approach was taken to interviewee selection. Purposive sampling is a non-probability approach whereby key groups of people are selected to survey (Weisberg, Krosnick, & Bowen 1989). In this instance, interviewees were selected if they had been closely involved in the decision making process and consisted of information providers and decision makers. The inclusion of interviewees other than decision makers enabled triangulation of the data that was available to decision makers and provided by information providers and other stakeholders. Interviewees were typically in the middle to senior management levels of the organisation ranging from the Chief Executive Officer (CEO) and Chief Information Officer (CIO) to the IS and project manager.

3.7 Data gathering technique

The data gathered for this research included the observed, verbal and documentary evidence of organisational history, relevant contextual factors, justifications for decisions, and the stated decision factors from interviewees. The research undertaken used a combination of data gathering techniques including direct observation, semi-structured interviews and document gathering. Data gathering relied on a high level of access to personnel and organisational documentation. Of particular interest were the decision makers in organisations where ‘elite’ (Gillham 2000) interviews, or interviews with people in authority, could be conducted.

Interviews were conducted based on a set script of thirty-six questions (see Appendix A, page 337). Interviews are one procedure for ‘obtaining information directly from a group of individuals’ (Dane 1990 p. 120) and can be used to extract facts, opinions and behaviours (Dane 1990). They are most frequently used to measure attitudes and preferences, beliefs, predictions, facts and behavioural experiences (Weisberg, Krosnick, & Bowen 1989). Researchers often measure *beliefs* as they are interested in finding out

what people believe is true (Weisberg, Krosnick, & Bowen 1989). In this research, it was the beliefs of decision makers as to what factors affected their decision making that was of interest.

Dane (1990) stated that an interview instrument should have a clearly defined topic. The topic for the interview was the factors used to make decisions relating to the adoption and selection of IS. Data gathered included the participant's role within organisation, type of organisation, the type of IS project, the participant's experience with IS projects and the factors that the participant considered when making IS decisions.

Five themed categories of questions were devised to elicit information from interviewees: organisational structure and interviewees' role within the organisation, IS within the organisation, decision processes, factors and information, and decision outcomes. These categories of interview questions were developed in response to the literature review and in order to provide the relevant information required to address the research questions. For example, the first two categories of questions determined the role and manifestations of contextual factors as discussed in section 2.5.2. Questions concerning process were informed from the coverage of decision making in section 2.4. Questions concerning decision factors were motivated from the literature on informational and contextual factor use in section 2.5. Finally, questions concerning decision outcomes were informed by the literature on possible pre-implementation decision linkages discussed in section 2.6

Interviews were conducted face-to-face in a semi-structured manner. Dane (1990 p. 128) defined an interview as 'a structured conversation'. Focused, or semi-structured interviews are useful in gaining information about the perceptions of respondents (Dane 1990). Although interviews for this research were structured around a script, they had semi-structured elements that provided scope to pose additional, clarifying or context

gathering questions as required. This technique was supported by Gillham (2000) who contended that semi-structured interviews can be the richest source of data. In supporting this, Sekaran (2003 p. 224) noted that:

Structured interviews are those conducted when it is known at the outset what information is needed. The interviewer has a list of predetermined questions to be posed to the respondents either personally, or through the telephone, or through the medium of the PC. Through this process, new factors might be identified and a deeper understanding might result.

The selection of interviews as a data gathering instrument stemmed from their advantage of flexibility (Dane 1990; Sekaran 2003). Face-to-face interviews are particularly advantageous as they allow the interviewer to clarify questions and ensure the responses are understood (Sekaran 2003). Face-to-face interviews also have a better response rate than telephone interviews (Weisberg, Krosnick, & Bowen 1989). While telephone interviews allow many people to be contacted in a relatively short time, interviewers are unable to pick up nonverbal signals that may lead into supplementary questions in a face-to-face interview (Sekaran 2003). One key reason for conducting face-to-face interviews in this research was the need to establish trust. It was important for the organisations and interviewees to be assured that confidentiality would be maintained and face-to-face interviews provided a more conducive interview environment for this to occur. Interviews typically took approximately one hour and were recorded electronically. They were supplemented with written notes and observations and, where necessary, clarifying emails and telephone conversations. Individual interviews and notes were summarised into electronic documents. Additional organisational documentation was either provided to the researcher electronically or sighted and notes taken.

Interviews and data gathering at organisations halted when data saturation occurred.

Data saturation was determined based on Sekaran's (2003 p. 225) opinion that:

When a sufficient number of interviews have been conducted and adequate information has been obtained to understand and describe the important factors operating in the situation, the researcher would stop the interviews.

Due to the richness of the data collected and the effectiveness of the interview instrument, a maximum of six interviews were required in each organisation. A total of nineteen interviews were conducted during the research.

3.8 *Analytical technique*

Yin (1993) acknowledged the difficulties in analysing case study evidence and noted that there are not any particular set ways or methods to accomplish the task. The key theme to the analysis techniques is explanation building (Yin 1993). Yin (1993) describes explanation building as a logical process whereby case study evidence is examined in the context of the theory proposed. This both tests the theory and allows it to be revised, while providing a greater understanding of the organisation and the evidence being examined. In this instance, the research aimed to build understanding that resulted in theory. To do this, factors and relationships were examined and theory was proposed and tested in a cross-case analysis. This method aligns with Eisenhardt's (1989) description of the recursive analysis and theory building process. In this research, a specific recursive analysis technique, hermeneutics, was used.

Myers (1994a; 1994b) proposed that hermeneutics, particularly critical hermeneutics, provides an interpretive approach to researching IS implementations. Hermeneutics is a method of analysis and interpretation of text for the purpose of understanding and in some cases, exposing underlying meaning (Byrne 1998). Using hermeneutic techniques

has permitted this research to fully explore context as well as discover factors and relationships that affected decision making and outcomes.

As Yin (1994) noted, analysing case study evidence is difficult. Miles and Huberman (1994) gave several possible techniques using tabulation, creating flowcharts and chronological ordering. Although tabulation and sorting played a role in the summation and classification of the data, a more powerful method was required to explain and justify the responses to the research questions. This resulted in the use of a critical hermeneutic methodology to examine the case study narratives. Through the hermeneutic analysis of the text, decisions were analysed for disparities between the parts of the text (or the information) and the phenomenological meaning (or actions). This examination of the information and contextual influences and the resultant decisions revealed some factors that were undisclosed or implicit. These in turn were used to gain further understanding of how other factors interacted and decisions were reached. This hermeneutic process follows the iterative loop that Yin (1994) describes as explanation building.

3.8.1 Hermeneutics

Hermeneutics is a method of analysis and interpretation of text for the purpose of understanding and in some cases, exposing underlying meaning (Byrne 1998). While traditionally hermeneutics has been used to interpret text, its modern application covers a broad spectrum of social, political and scientific disciplines where the text, or analogue, can be documents, processes, social structures or narrations. It has been used to discover and interpret the reasons for IS project failure (for example, Myers (1994b)), explore information richness in electronic mail (Lee 1994) and has also been used to explore decision making factors and processes (for example Whitley (1993)). While still more commonly used in social science and humanities, hermeneutic techniques are becoming more prevalent in research in areas including health and technology and are

potentially important approaches to analysing organisational relationships with information systems (Harvey & Myers 1995).

Hermeneutics emphasises the social, political, cultural and historical aspects of understanding. As a methodology of interpretation, it evolved from the praxis of interpreting biblical texts (Demeterio 2001b). It evolved in the 19th century into a more formalised philosophy through the work of Friedrich Schleiermacher with a focus on a science of human understanding (Byrne 1998). Modern hermeneutics was strongly influenced by Edmund Husserl, who founded the phenomenological movement (Byrne 1998; Demeterio 2001b). It was expanded on by Martin Heidegger who proposed the concept of the hermeneutic circle and Hans-Georg Gadamer, who developed the concept of *critical hermeneutics* (Demeterio 2001a).

Ramiller (2001) used hermeneutic techniques to analyse the phenomenon of the *Airline Magazine Syndrome*. Ramiller (2001) examined why apparently irrational actions occurred and how they could be avoided. Ramiller steered away from the language of hermeneutics by describing his analysis in terms of actors, drama, plot and narrative. However, the purpose of dissecting the narrative was to obtain an understanding of the motives of the actors involved in the story by looking at their actions and the context in which they occurred. Ramiller (2001 p. 292) stated that:

We want to interpret the story in light of what it is reasonable to infer about the social context in which it arises and is told. Accordingly, we will weave between text and context, examining the interplay of characters, their actions and interactions, their goals and motives, their means, the setting, and ultimately the outcomes, as we endeavour to extract the meaning of the story.

Heracleous and Barrett (2001) used hermeneutic techniques to analyse the failure of an electronic trading system implementation in the London insurance market between 1993 and 1998. Their particular focus was on the explicit communicative actions of the various actors and their underlying implicit deep structures or the beliefs, rules and interpretive schemes that the actors used. Their research was presented as an interpretive case study using hermeneutic text analysis and rhetorical enthymeme, or argument, identification. In other words, the central themes, beliefs and arguments of the actors were drawn out of their actions and analysed within the context of the events. The purpose of this approach was to observe and explain the interaction between the implicit beliefs and structures and the communicative actions of the actors. What appeared to be a very complex series of interactions between many actors became explicable using the hermeneutic analysis. Of particular importance was that the analysis was able to identify underlying assumptions, understandings and values that drove decisions and actions and that contextual factors affect and become affected by such decisions and actions (Heracleous & Barrett 2001).

3.8.2 Critical hermeneutics

Critical hermeneutics looks for the underlying meaning, motivations and influences within the text or narrative (Byrne 1998; Demeterio 2001a; Harvey & Myers 1995). It assumes that the meaning of the text can be obscured by a number of factors. Traditionally, these factors include context and ideology, although in an organisational context they include motivation, hidden agendas and power structures. These motivations and influences have to be identified to see why the actions within the text occurred or what they really meant. In an organisational context, critical hermeneutics focuses on the communication between actors, particularly managers, and is useful in understanding and analysing the interactions between organisational culture and power (Phillips & Brown 1993).

Critical hermeneutics acknowledges the presence of bias, particularly the bias of the interpreter. As part of the analysis of the text, this bias is declared and used to help interpret the text. It is particularly important in critical hermeneutics to look for historical and contextual influences in the text, as they are the key to underlying meaning. As Myers (1994a p. 57) stated, critical hermeneutics ‘emphasises both the subjective meanings for individual actors and the social structures which condition and enable such meanings [that] are constituted by them’.

Myers (1994b) successfully used critical hermeneutics in his analysis of the implementation of a large information system in New Zealand. In 1989, the New Zealand Education Department implemented a new payroll system. The system’s rollout was plagued by a series of failures resulting in employees being underpaid or not paid at all. Eventually, though the system was fully operational, it was abandoned after six months. Myers’ (1994b) narration was sourced from a number of locations, each giving a different stakeholder perspective. The actual analysis drew in both the narration and the context to look at why the system was implemented in the first place and why it was eventually abandoned. Not surprisingly, there were underlying factors that were not disclosed or acknowledged in any decision, nor were obvious in the narration. By looking at actions, context and motivations, these factors became apparent. In a later study (Myers & Young 1997), similar methods were used in a ethnographic study of an IS implementation in the New Zealand health sector. Again, the particular focus was analysing the narrative for how hidden agendas and politics affect IS projects.

Philips and Brown (1993) demonstrated the use of critical hermeneutics in analysing corporate communications within a Canadian energy resource company. The focus of their study was to interpret and explain the actions of a senior management driven corporate advertising campaign. The main point of the analysis was to examine what

was not explicitly said and communicated in the advertising, but what was intended and what motivated the communication in the first place. While the study was not directly relevant to IS management decisions, it did emphasise the value of critical hermeneutics in understanding organisational motivations relating to power, politics and other contextual influences. This study clearly reiterated the value of critical hermeneutics in looking for the indirectly stated, undisclosed or obscured reasons behind why actions are performed through the analysis of information and context.

3.8.3 Cross-case analysis

Understanding and theory building followed Eisenhardt's (1989) analysis guidelines. Firstly, individual case 'write-ups' (Eisenhardt 1989 p. 540) were developed from the data collected at each organisation. These write-ups are a combination of interview data, observations and documentation. The write-ups contain direct quotes and are rich in raw information and contextual data. These are purely descriptive and do not contain linkages, propositions or identification of trends. The purpose of the write-ups was to establish a textual source for deeper recursive analysis.

From the case write-ups, case narratives in the form of individual case study chapters were developed. These constitute chapters four to seven of this thesis. These chapters present the reader with the rich contextual background and understanding of the problems and suggest linkages and theories to explain what occurred at each site. Linkages, understanding and theory were developed through the hermeneutic analysis process.

Finally, cross-case analysis was performed to address the research questions. This analysis was supported with raw data and where necessary, recursive hermeneutic analysis was performed so that theories as to how information and contextual factors affected decisions could be refined. For the exploratory aspect of the research, common

factors across studies were identified from the case study narratives. As part of the cross-case analysis, a comparison with the extant literature occurred. As Eisenhardt (1989) noted, the purpose of this process is to build confidence in the findings by providing explanations from the literature and where relevant, identify and discuss conflicting literature in order to refine theory and build insight.

3.9 *Research integrity*

Research integrity was maintained by adhering to Klein and Myers' (1999) seven principles of interpretive research. The principles were derived from research in anthropology, phenomenology and hermeneutics. They were designed to guide IS interpretive researchers as well as to provide a semi-structured way of evaluating such work. Klein and Myers (1999) argue that the seven inter-related principles of interpretive research are not mandatory and provide the researcher with some discretion as to how they are applied. This research was conducted to conform to the seven principles as outlined in this section.

The first principle, known as the fundamental principle of the hermeneutic circle, is a concept whereby understanding and knowledge of a complex whole, where the whole may be a situation, idea, concept or processes, comes from preconceptions about the parts and their relationship with the whole (Klein & Myers 1999). Thus understanding is an iterative process of interpretation where each instance of understanding a piece or part of the overall concept affects the understanding of the whole, which in turn affects the way in which new pieces of information are interpreted. This principle is the basis of the remaining six principles and guides the researcher's application of them (Klein & Myers 1999). It is this principle that helps define what information the researcher seeks and how it is obtained. For example, it can be used to help understand and resolve contradictions in a case study by forcing the researcher to go back and look for missing information. This information may in turn, alter the understanding of the problem as a

whole. As part of this research process, interviews and documents provided the basis for a descriptive text-analogue that was later analysed and repeatedly reviewed in order to increase understanding and suggest theory.

The second principle is the principle of contextualisation. Klein and Myers (1999) stated that research results must be given or reported within the context that they were obtained. They further stated that ‘interpretivists argue that organizations are not static and that relationships between people, organizations and technology are not fixed but constantly changing’ (Klein & Myers 1999 p. 73). Thus, the context can include the historical and organisational influences. The importance of context relates to the interpretive understanding that a situation and the directly influencing factors are *only* relevant in that given context, thus meaningful understanding can only be gained through explicit acknowledgement of that context. This is highly relevant in this research, as was demonstrated in the literature review, decision making is greatly affected by contextual influences, thus decisions can sometimes *only* truly be explained by their context and contextual influences. By using a number of data sources and through the design of the interview instrument, this research has attempted to explicitly identify the most influential contextual factors relevant to the studies.

The third principle, the principle of interaction between the researcher and the subject, acknowledges the effects of the interaction between the researcher and the participants in the research and their understandings and perceptions. It requires that the researcher be conscious of the fact that participants in the research can themselves be interpreters and that their interpretations will be affected not just by the researcher and the questions they are asking, but other sources of information and influences (Klein & Myers 1999).

The actual act of asking participants for data can change the participant’s own interpretation of the data. Researchers are required to acknowledge this interaction, describe how data was gathered and how these interactions may have affected the data.

In the context of this research, it would have been ideal to remove all potential for biasing or affecting the data through interactions with the research participants by observing organisational making within the organisations. However, in the context of investigating decision making, this was not viable as interactive discussions in the form of interviews were one of the primary ways of determining the information that participants acknowledged that they used when making decisions. However, where possible, additional data from documents and other decision makers was used to substantiate the data gathered directly from interviewees. While seeking to avoid affecting the research participants through the method and content of the data collection, the analysis of the information has included acknowledgement of the potential for these effects.

The fourth principle is that of abstraction and generalisation. While seeking to avoid positivist restrictions of testing data against formal hypothesis devoid of contextual interactions, Klein and Myers (1999) encouraged the use of generalisations and formal theoretical abstractions to support a researcher's theoretical insights and logic. Klein and Myers (1999 p. 75) pointed out that 'theory plays a crucial role in interpretive research and clearly distinguishes it from anecdotes'. This research has drawn upon hermeneutic theory, particularly critical hermeneutics for collecting and interpreting data and building theory from the results.

The fifth principle is that of dialogical reasoning. This principle requires the researcher to declare and acknowledge their own biases, preconceptions, prejudices and assumptions as part of the research process (Klein & Myers 1999). Rhodes (1997 p. 4) stated:

The problem with interpretive representation is that they foreground the researcher as the author of the meaning of the organisational experiences being studied. This interpretive tendency is highly problematic.

In other words, the researcher's own beliefs and biases can shape the descriptive narratives and the way in which they are presented. While hermeneutics acknowledges the value of preconceptions in order to gain understanding, these biases must be set aside when final analysis is performed. Prejudices and biases may in themselves lead to a better understanding of research findings (Klein & Myers 1999). By a researcher using their initial prejudices to gain an understanding of a situation, this can lead them into the first iteration of the hermeneutic circle while seeking out more information. This, in turn, can lead them to alter their understanding or theory to more accurately reflect the reality of the situation. As this research used critical hermeneutic analysis, such a statement of bias and assumptions is essential. This research has included a statement of the initial assumptions of the author with a historic description of why the research was undertaken based on the author's previous experiences (see section 3.10, page 94).

Klein and Myers' (1999) sixth principle of interpretive research, the principle of multiple interpretations, requires researchers to seek out and study multiple viewpoints and reasons for actions. This is especially important in overcoming the potential bias the researcher brings to the narrative or its analysis (Rhodes 1997). Researchers should also seek out, highlight and explain any contradictions in the viewpoints and where applicable, revise their theory. Contradictions may in themselves, help validate theories. For example, if it is assumed that there are unacknowledged factors that affect IS decision making, then this may be partially substantiated by these factors being mentioned by some interviewees or external sources but not by others. As part of this research methodology, interviews have been carried out with several individuals within each organisation. This has provided a greater understanding of the contextual factors

affecting decisions as well as the perspectives of those individual within the organisations. Contradictions have formed part of the critical hermeneutic analysis and have also guided the information gathering process.

The seventh principle, that of suspicion, requires researchers to seek out social distortions and false preconceptions in the information they gather from participants (Klein & Myers 1999). This goes beyond just understanding, but looking at underlying meaning and subtext. It is this principle that is the core of critical hermeneutics (see section 3.8.2, page 87). As Klein and Myers (1999) point out, it is the least developed interpretive principle in IS research literature. However, by questioning the face value of information and looking for underlying meaning, researchers are able to uncover the organisational, social and political interactions and structures that underpin actions. As this research focussed on undisclosed factors and motivations, this principle has been core to the research. When combined with the sixth principle, the detection of contradictions, the reasons for the contradictions have been derived by analysing information from the research participants. These reasons have been tested with critical hermeneutic analysis.

3.10 *Limitations*

This section outlines specific limitations of this research beyond time and resource constraints. The methods used to redress to these limitations are also discussed.

3.10.1 *Organisational suitability and availability*

A considerable challenge to this research was obtaining suitable organisations in which to conduct data gathering. This was due to a number of factors concerning resourcing, size, decision maker availability and confidentiality. One concern of organisations when asked to participate was what resources they would be required to provide and for what period of time. Many potential interviewees were senior in their organisations and their

time was exceedingly valuable. This was especially problematic when access to consultants was required. Organisational size became problematic because gaining access to the people at senior levels in large organisations was often difficult. Larger organisations were very difficult to build relationships with and it was often difficult to identify who were the appropriate interviewees.

Once access to organisations was obtained, interviewee availability often became an issue. It was not uncommon to find that a key decision maker was no longer with an organisation because of organisational change or professional career advancement. The effect of this limitation was moderated by conducting additional interviews with information providers and using additional documentation. Finally, confidentiality was a major obstacle to engaging with organisations. By its very nature, this research examined some of the irrational elements of decision making. It also required access to sensitive internal information. Understandably, this made organisations and interviewees suspicious and cautious. However, in very few instances did interviewees attempt to conceal information. In these cases, triangulation with other sources identified the activity and this in itself led to a better understanding of the organisation. Even with these issues, four different but information-rich organisations were willing to participate in this research. However, a limitation of this research was that the organisations were screened by the constraints identified in these limitations.

3.10.2 Biases

As discussed in section 3.9, Klein and Myers' (1999) principle of dialogical reasoning requires the researcher to declare and acknowledge their own biases, preconceptions, prejudices and assumptions as part of the research process. This researcher had a technical background in information technology and had been involved in a number of IS projects. Before undertaking this research, I believed that many IS decisions were irrational and often made for poorly defined reasons. This established an *a priori* belief

that IS project failure was related to poor decision making, particularly in the pre-implementation phase. While not having strong preconceptions of the type of factors that were affecting decision making, I believed that vendor and peer pressures had some role to play. My key assumption was that senior managers did not always disclose the real reasons for their IS decisions. These beliefs are not uncommon amongst IS practitioners who have had either direct exposure to IS projects or have been indirectly influenced by peer opinions and, to a lesser extent, trade literature. As such, these beliefs do not constitute a personal and atypical contaminate to the research findings.

3.11 *Ethical issues*

Ethical clearance to conduct this research was required and granted by Central Queensland University Human Ethics Committee. The conditions of the research were that participants and organisations remained anonymous in any publications including this thesis (see informed consent package, Appendix B, page 340). All materials relating to the research remained secured at all times, either electronically or physically.

3.12 *Conclusion*

This chapter has detailed the method used to undertake research for this thesis. It has been explained that the aim of the research is to build understanding of specific decision making phenomena and develop theory. It has been argued that in order to do this, an interpretive approach was required to capture the complex interactions between people, technology, politics and other organisational factors. A qualitative case study methodology was selected in order to examine four large organisations that had implemented significant IS projects. As supported by the literature (see for example Yin (2003)), case studies provide a proven method for examining complex social phenomena such as decision making. Studies were conducted using multiple data gathering techniques, primarily based on the application of face-to-face semi-structured interviews. It has been stated that this research does not claim statistical generalisability.

However, it has been argued that deep understanding and theoretical generalisability from empirical observation can be achieved from the number of cases examined in this thesis.

In order to analyse the data, interviews and documentation were collated into case write-ups. From the case write-ups, individual case studies were developed and then analysed using an interpretive hermeneutic technique. Hermeneutic techniques have been shown to be an accepted analysis method in IS research, and examples have been provided where they have been successfully applied to describe complex socio-technical interactions. It has been argued that in this research, the use of a hermeneutic analysis has provided an analytical method that has explained decision-factor relationships, some of which were implicit and undisclosed. Following the development of descriptive case studies, a cross-case analysis was developed. This analysis followed the method described by Eisenhardt (1989) in order to address the research questions and develop theory. Research integrity has been maintained by following the Klein and Myers' (1999) seven principles of interpretive research. It has been argued that these principles have provided both integrity and strengthened the data gathering and analysis process, especially through the acknowledgement of the role of bias in developing understanding.

In the following chapters, four to seven, the descriptive case studies are presented. These describe in detail the individual organisations, decision makers, decisions taken and the factors involved in the processes. Following these, chapter eight presents the cross-case analysis where the research questions are addressed and resultant theory is described by drawing from the individual cases studies.

Chapter 4

Organisation A

4.1 *Introduction*

As discussed in chapter two, many information systems (IS) projects end in failure. These failures frequently result in re-evaluations and re-implementations of technology. This case study examines such an event in a commercial utility. The chapter describes the pre-implementation decisions surrounding a three hundred thousand dollar re-implementation of a business intelligence suite over a four month period. It also examines a contemporaneous one hundred and ten thousand dollar infrastructure upgrade process and the decisions and factors that led to its selection. The examination of these two projects provides an indicative sample of the informational and contextual factors that affected IS decisions in this organisation. In order to explain how these decisions occurred, the organisational history will be examined alongside the decision making processes and information sources. The chapter then details the justifications and the factors that were nominated as having effects on IS decisions within the organisation. Finally, this chapter will examine how these factors related to decision outcomes.

4.2 *Overview*

Organisation A is a commercial utility involved in electricity generation with revenues exceeding three hundred million dollars per year. It was formed as a result of the commercialisation and deregulation of the electricity industry and as part of the separation of electricity transmission and generation services. The organisation employs approximately three hundred full-time employees; however it maintains up to another two hundred contract staff. The organisation is distributed over more than a dozen power generation and administrative sites throughout Australia.

4.2.1 Interviewees

Six interviews were conducted independently within the organisation relating to two IS projects. The interviewees came from the IS group and consisted of the IS Manager, the IS Operations/Infrastructure Manager, the Business Systems Manager, a Business Systems Project Manager, an IT Solutions Project Manager and an Analyst Programmer. Four of the interviews were conducted face-to-face and two by video link.

The IS Manager reported to the chief financial officer (CFO) and directly supervised the IS Operations/Infrastructure Manager and the Business Systems Manager. He participated at the steering committee level of most IS decision making. Having had over nineteen years of involvement with the organisation in a number of technical engineering roles, the IS Manager stated that his expertise is management, remarking that:

My technical background is sufficient to stay on top of the technical issues in IT as long as I don't have to get in there and start programming the routers and things ... Sometimes I think not being as technically switched on ... not as involved you have a better chance of seeing holes or flaws in the argument [made for IS projects].

His primary use of technology was in day to day activities such as email and word processing. He felt that IS was not strategically important or critical to the organisation, stating that:

Our organisation doesn't live or die on IT – we're not a bank ... our organisation would not die if we didn't have IT facilities for a week ... we'd still

generate electricity and get paid for it and have a profit at the end of it all .. but it would make our business difficult to run and make it inefficient.

The IS Operations/Infrastructure Manager reported directly to the IS Manager and supervised approximately thirteen technical staff. She was tasked with making high-level IS decisions and advising the IS Manager and steering committees. While describing her expertise as people management, the IS Operations/Infrastructure Manager had a strong technical knowledge and used technology in all facets of her daily work. She felt that IS was strategically important to the organisation in meeting its objectives.

The Business Systems Manager reported directly to the IS Manager and supervised seven staff made up of programmers and project managers. At the time of the interview, he had been with the organisation three years, having been recruited at the same time as the IS Operations/Infrastructure Manager. He was tasked with making high-level IS decisions and advising the IS Manager and steering committees. He described his expertise as people and project management. The Business Systems Manager had a high-level knowledge of IS with a business focus on technology. He used technology daily as a tool for project management, cost tracking and for common desktop applications. Strategically, he saw IS as a tool for achieving business goals.

The Business Systems Project Manager reported directly to the Business Systems Manager and supervised project team members as and when required. He had a three year history with the organisation and was tasked with making operational IS project decisions and justifying these to his manager. He described his expertise as being a business analyst. The Business Systems Project Manager had a technical background in the development of software applications and used IS both as a user and working with his team at the technical level for code debugging. He believed that IS was strategically

used to facilitate core business and that the organisation had a heavy reliance on it for operational infrastructure such as communication systems.

The IT Solutions Project Manager reported directly to the Business Systems Manager and supervised project team members as and when required. She had an eleven year history with the organisation and was tasked with the preparation of business cases and ongoing project management. She described her expertise as project management but had a strong hands-on technical background to draw upon. The IT Solutions Project Manager described her daily interactions with IS as that of the user level, such as using word processing and email applications. She saw IS as strategically important to the organisation in its role of making data available at all times to users. She commented that:

The organisation sees IT as an enabling process ... politically, they understand that IT is part of, if they want to get something done, IT is a component of something that they are going to have to understand and seek more information about earlier in their project.

The Analyst/Programmer reported directly to the Business Systems Manager and acted as a team leader to contract staff as and when required. He had an eighteen month history with the organisation and was tasked with day-to-day analysis and coding. He described his primary expertise as coding and used IS extensively in his daily duties to develop and debug programs. He believed that IS was seen strategically as a tool for efficiently performing manual tasks, stating that its role was to ‘simplify and steam-line manual tasks where possible, to make the people on the ground do their job easier and quicker’.

4.2.2 Organisational history

Information systems were used extensively within the organisation and while not part of the core business, IS assisted in the operation of facilities, managing financial and human resources, reporting, asset and risk management and maintenance. However, traditionally and politically, IS was not regarded as having critical strategic importance within the organisation and was primarily regarded as an enabler or service provider.

Historically, IS in the organisation had evolved from ad hoc projects with little project management into structured, project-managed undertakings. The major change occurred three years before the data was collected. At that time, organisational structural change occurred within the IS group and the IS Operations/Infrastructure and Business Systems Manager were appointed. The IS Manager noted that:

At that time, putting in IT projects were a real challenge for us because we were busy putting out fires and it was difficult to focus on making step changes and make a real significant impact in infrastructure when we were continually trying to solve faults and problems in the current structure... that's when I decided we need to completely restructure the group and [two managers] came on board and a projects group was created to focus people specifically on nothing more than the changes that were required

Change was perceived as a positive, as IS staff were able to move from ‘fire fighting’ to proactive user engagement with the aim of ‘value adding’ to the business. As the IS Manager noted, ‘Since that time we’ve made substantial inroads into the support systems and [the] infrastructure that exists ... as a result, the fires started to disappear as well’.

The change had been both organisational and political as the maintenance and support operations were separated from the projects and development arm of the IS group. At the time of the interviews, many of the support operations were performed by contract staff under supervision from the IS Operations/Infrastructure Manager. The development projects were primarily initiated and controlled from within the business systems unit. The issue of control and the initiation of a project based culture in the organisation was seen as a significant part of the change process. The Business Systems Manager explained:

When I first arrived our IT staff really didn't know what a project was. It was a case of all our staff, all in, there were no role definitions and delineations, if there was anything happening, anybody would have a go. There was no project methodology and certainly no guidelines on how to deliver something between budget and time frame in any sort of regimented way ... it wasn't very disciplined ... People just tended to dive in and do stuff and didn't know when it was going to finish ... [however] In the last three years, we've put a lot of effort into developing a methodology that we can follow and to introduce a project mindset.

These changes led to a more structured approach to decision making relating to the IS projects undertaken within the organisation. The IS Operations/Infrastructure Manager noted that:

Now, there has been a subtle shift because the organisation has reviewed how they handle projects, they are also looking at the other technicals (sic) ... to build a [facility], IT needs to be in there early ... we've come a long way in three years.

Since the introduction of the more formalised structures, IS projects had been perceived as generally successful by the interviewees. Success was defined within the organisation as a project meeting the business objectives, not necessarily the time and budget targets.

The IS Operations/Infrastructure Manager described how the success criteria involved ‘having a very clear objective about what we want to achieve out of [a] project at the end of the day and what kind of position it would put us in as a result of the project being very successful’. IS projects that provided transparent or value-adding functionality for users and high levels of user consultation were seen as the most successful.

As an example, interviewees noted that an earlier infrastructure upgrade had been an outstanding success, but had relied on a high level of informal decision making. The IS Manager explained:

I don't think the decision making processes at that stage were particularly outstanding ... we got lucky ... we knew intuitively what we had to do and did it but the business case, the justification ... the decision wasn't particularly strong at that stage ... we needed some wins and we needed them fast ... and the corporation made that clear to us ... so we pushed ahead regardless ... things have matured a great deal since ... at that stage, guys could come to me and say “I reckon we should be doing this” and giving me a verbal and I'd approve 100K to do it ... these days it doesn't work that way ... these days the decision process is much more rigorous and we have to show value for our efforts.

While the organisation had a history of IS project successes, it also had instances of project failure. One failure example given was an implementation of a document management system. The project was abandoned for a variety of reasons; however the lack of management support and confidence in the project was regarded as the primary failure cause. The Business Systems Project Manager described the project as ‘[a] ship

without a rudder type thing ... then a ship with too many rudders – no focus, no plan'.

The Operations/Infrastructure manager noted that 'It [the project] was seen to being driven by IT'.

Another example of a failed IS project was the adoption and implementation of a project management tool. The tool was purchased and implemented on the instruction of management in contravention to the advice of the IS team. This was a politically influenced decision that was based purely on 'hearsay' and bypassed scoping and technical advice from the IS team. The Business System Manager explained that:

We're a [Project tool A] shop. However, we have a couple of high political players that like [Project tool B] and have convinced some of our [facility] people who manage outages to use [Project tool B] and again this was something that was a political decision where we had no opportunity to have a look at the product and see how it was going to fit with our infrastructure. Now, we are having to deal with that product, which is going to grow and cause issues for us.

Interviewees associated the failure of another project with misleading information from vendor sales staff. A network monitoring tool was selected based on sales information which later proved to be incorrect. This was regarded as an expensive mistake as the organisation was left with an unusable product. Interviewees noted that this had shaped changes to decision making practices in order to encompass more external information checks, as the IS Manager noted:

It was based on, to a fair extent, sales representation from the organisation we were dealing with at the time I'm less than happy with that organisation ...

in fact [they] recently wanted to get more work with us and were making various recommendations and I'm very sceptical.

4.3 Specific projects

Two contemporaneous IS projects within the organisation were discussed during interviews. The first project concerned the implementation of a business intelligence suite for the organisation's enterprise resource planning (ERP) system. The second project concerned the implementation of a network infrastructure upgrade.

The discussions relating to these systems formed a mesh of experiences and factors that related to how IS decision making occurred within the organisation.

4.3.1 Business intelligence suite

As part of an ERP implementation project, a series of decisions had been taken with respect to the reporting needs of the organisation. Traditionally, ERP systems are delivered with a limited number of standard reports so it is normal for additional customised reports to be written as part of an implementation. There are a number of approaches that can be taken to deliver these reports; however the strategy used by the organisation was to implement a suite of business intelligence tools. This suite consisted of a data extraction tool, a physical database called the data warehouse and a reporting tool. For performance reasons, the data extraction tool was used to copy and manipulate data from the live 'production' database into the data warehouse. Users ran reports against the data in the warehouse. The reports were written by developers using the reporting tool. The structure of the suite is depicted in Figure 4-1.

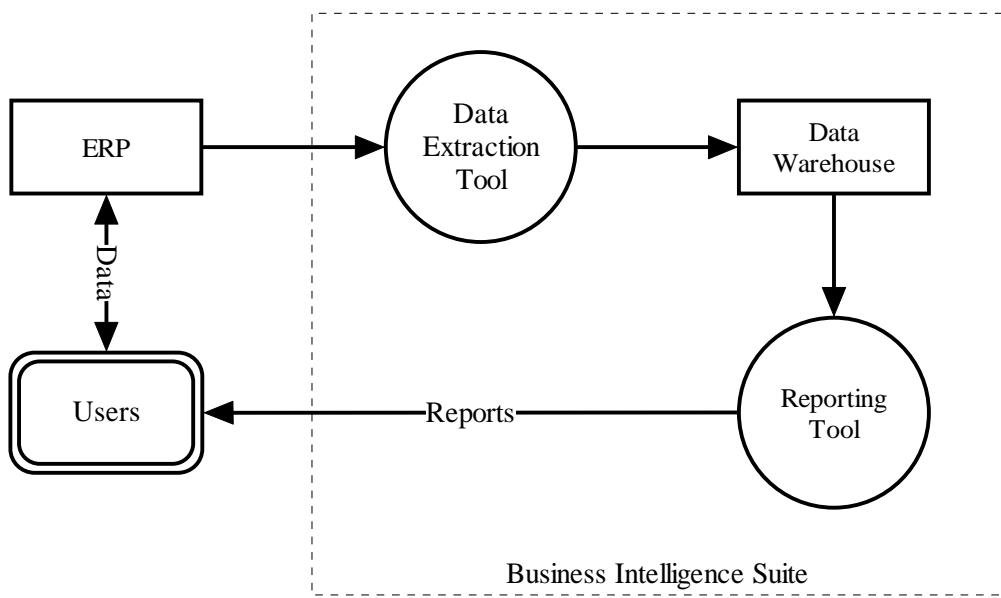


Figure 4-1 Business intelligence suite

The purchase of the business intelligence suite was conducted as part of the purchase of the ERP. The organisation, as a result of a high-level, politically affected management decision, purchased a data extraction tool from the same vendor as the ERP. This decision was not negotiable at the time though the Business Systems Project manager noted that ‘We didn’t have to buy it [in particular] but the decision was made to buy it’. The reporting tool was purchased from a third party vendor.

During the last twelve months of the ERP implementation, resources were ‘poured into’ developing reports, mainly in the form of money for contractors. In the opinion of the Business Systems Manager and the Analyst Programmer, the implementation was performed badly, especially in terms of the resulting data warehouse design. They believed the project suffered because it was reactive to new requirements under increasing time pressures. ‘We really didn’t get a chance to structure the warehouse to move forward’ noted the Business Systems Manager.

Although the first batch of reports was eventually completed, this build of the data warehouse structure and reports was not regarded as successful. The structure of the data warehouse required constant revision leading to less time available for the development of reports. The Analyst Programmer felt that the many of the pre-implementation decisions regarding the first failed implementation were related to its failure. Citing a lack of experience, the Analyst Programmer explained that the technical team had to make all the strategic and technical decisions, stating that:

Well, that's the problem we had – when we first did it, [consultants] and I had never done a data warehouse hence the reason for the redesign because ... we didn't know what data warehousing was about.

As a result of design problems and general dissatisfaction from the users regarding the quality of the reports, a three hundred and fifty thousand dollar project was launched to re-implement the suite. The IS Manager explained that:

There was a lot of dissatisfaction of the ERP system and that was largely because they [members of the organisation] couldn't get any of the information out of the system that they needed, so that certainly weighed heavily on the decision [to re-implement the business intelligence suite].

'It was essentially to try to make our business recognise that we have to re-look (sic) at the warehouse, restructure it so that we can more easily produce reports and provide some ad hoc reporting capability to our user base' stated the Business Systems Manager. An evaluation of two options occurred, a business case was regenerated and pre-implementation decisions relating to the implementation and tool selection were made.

4.3.2 Infrastructure upgrade

The organisation is distributed over a number of remote sites which presents challenges for data and telecommunication integration. One remote site had experienced a series of network infrastructure performance problems that related to old technology and lack of scalability. As a result of internal business pressure, a decision was taken to upgrade the infrastructure. The organisation took the opportunity to examine all the available technologies that would suit the needs and constraints of the remote site and its clients. As part of the process, clients at the remote site were provided with four options and were given the ability to provide feedback. The network hardware upgrade was relatively minor financially, at a cost of approximately one hundred and ten thousand dollars, and in complexity, with a project team of between two and five. However, the project and the decisions surrounding it impacted heavily on the user group and the reputation of IS operations in the organisation. The project also provided insight into how decision making within the organisation was affected by external factors.

4.3.3 Decision making processes

This section examines the decision making processes taken in the two decisions. An organisational comparison and summary of these processes can be found in section 4.4.1 (see page 131).

4.3.3.1 Business intelligence suite decision making process

The process taken to reach pre-implementation decisions surrounding the re-implementation of the business intelligence suite consisted of a series of formal evaluations and plans that were elevated through decision makers and bodies within the organisation. Interviewees reported that this was regarded as standard practice in the organisation, and documents were provided that supported these claims. However, as

the IT Solutions Project Manager noted, it was not unknown for these processes to be over-ridden. She remarked that normally, formal processes were used, ‘unless it is somebody very high up who no one will stand up and say no to, it’s then the informal decisions are made and we’re just made to do it’.

The operational pre-implementation decisions relating to the selection and design of the business intelligence suite were taken by the IS manager and the Business Systems Manager. The Business Systems Project Manager was responsible for developing options and making recommendations to the Business Systems Manager based on discussion with his team and staff such as the Analyst Programmer. Ultimately, high-level decisions had to be endorsed through the Business Systems Manager and the IS Manager for presentation at the steering committee. The steering committee referred the final recommendations to the CEO for noting. The IS manager described the importance of the steering committee’s role with the statement that:

I wasn’t willing to proceed with the project unless it had executives on the steering committee because we went down this path once before and they told you to go ahead and do something and then they’d pull out at the last minute ... you have to have buy-in ... if they’re not championing it from the start, it’s destined for failure.

From this statement, it is clear that the role of the steering committee was partially political. While the steering committee was required to endorse and possibly question decisions, it was also required to display political commitment.

A consistent theme in the organisation was the need for confidence in decisions. Decision making was not regarded as the role of a single individual, but one of a series of endorsements. These endorsements were part of the consensus building process that

was politically necessary in order for decisions, and the IS department, to be supported in the long-term. The IS Manager explained:

I doubt, in many organisations, that decision are made by one person ... it's almost never the case ... people make recommendations and then get endorsement of those recommendations ... through that whole process, you get a feeling of confidence ... the people who ultimately make the decision probably have no idea what decision they are making ... they're not making a decision based on the technology or the business case ... they're making the decision based on the credibility of the people who've endorsed it through the process.

The issue of credibility was strongly linked with confidence and success as interviewees believed that the decision making process that had been established in the organisation relied on continued positive outcomes from decisions. The IS Manager explained:

If something goes to the steering committee, I want ninety-nine percent to be accepted. If we have a couple of failures, I'll lose that credibility [with the committee] and the whole process will start to fall down. The decision making process is one of confidence and credibility in the process more than it is in the specific information in the initiative.

Although the decision making process seemed to be directed towards confidence building, decision making was categorised as structured by the interviewees. This was supported by evidence of business cases and formal evaluations. However, there was also evidence that many informal decision making processes were used. In many cases, the opinions and judgements of junior technical staff were accepted and formulated as 'the decision'. In some parts of the decision making process, the Business Systems

Project Manager was given the ability to make major design and technical judgements based solely on this data. These decisions were accepted by the Business Systems Manager and the IS Manager. This process was substantiated by the Analyst Programmer who stated that:

We were sitting around white-boarding and then would go away and try it ... we were sort of coming up with the options ... [and making the decision] because we were the technical guys.

This was consistent with the level of confidence the decision makers had in their technical staff when formulating and supporting recommendations to the steering committee level of the organisation.

The quality of the decision making surrounding the business suite re-implementation was a cause of concern in some areas, although interviewees had mostly positive comments. For one decision, the Business Systems Project Manager noted that the adoption of the original data transport tool was regarded as ‘not negotiable’ thus the element of choice had been removed from that part of the evaluation process. This decision occurred informally and interviewees were unable to pinpoint exactly why it happened. There appeared to be a consensus mindset amongst the interviewees that the senior executives in the organisation would not support a change in this tool therefore alternatives would not be considered.

The Business Systems Manager felt that the decision making process was generally ‘okay’, but was concerned that the process was mostly about justifying a decision promoted by other business units within the organisation. He noted that:

It wasn't okay in terms of it was the cart before the horse ... we felt that we were having to justify something that other people should have been justifying ... we go into bat on behalf of other people who either aren't prepared to or for some other reason don't do that ... It is a little bit frustrating when you feel like you have to battle through a justification that is for these people anyway and these are the same people who are deciding and giving you such a hard time about spending the money.

The IS Manager was happy with the decision making process but noted problems in obtaining quality justifications from technical staff stating that there were difficulties in 'getting sufficient information documented in the right format to meet the process requirements [from technical staff]'. This comment at the time seemed to contrast with the IS Manager's willingness to accept decisions from junior staff. However, as will be discussed in section 4.3.5.1 (see page 118), the practice of keeping the appearance of formal justifications was important to the organisation.

Personal opinions and perceptions played a significant role in IS decision making within the organisation. The Analyst Programmer noted that his decisions relied heavily on personal preference and past experience, while the Business Systems Manager rated the impact of his own personal opinions as 'significant'. Drawing from personal experience and knowledge was common. Decision makers reported personal opinions were valued and trusted and formed the cornerstone of the decision making process. The IS manager stated that:

I think [my opinion] has a big impact. It's pretty unlikely if I say that I don't think we should be doing this ... I'm against it ... that it is very unlikely that the steering committee would endorse it. If I say that I think we should do it, then

there is a pretty good chance of getting it over the line ... but there is no guarantee ... I'd probably get about a 90% success rate.

When asked how much of his personal opinion was affected by personal knowledge, he responded:

You have to know enough to understand the concepts, understand what actually happens and know enough to be able to ask questions. As well as that, I need to have enough confidence in my own ability to ask even dumb questions because it's amazing the number of times I'll ask dumb questions and they'll [technical advisors] start to try to explain and I find [problems].

This reliance on personal opinions and knowledge was regarded as an important element in the pre-implementation decisions surrounding the business intelligence suite re-implementation.

4.3.3.2 Infrastructure upgrade decision making process

A formal business case and evaluation process was used during the decision making that involved technical staff and clients. The decision makers included the IS Operations/Infrastructure Manager, the IS Manager and the General Manager for the business unit at the remote site. The General Manager also acted as the client representative. The project was client driven, having been initiated from the remote site. The Operations/Infrastructure Manager remarked that 'The business is saying that they want an improvement ... that was all the requirements that kicked off the concept'. It was the clients, via the site General Manager, who were responsible for choosing the final implementation option. The options presented were screened and justified by the IS Operations/Infrastructure Manager.

Although the style of the decision making was categorised as formal by interviewees, there were aspects of selection and implementation decisions that were over-ridden in an informal manner. After the evaluation and consultation process, a business case was generated that presented an optimal solution in terms of cost and technology, however this was over-ridden by the General Manager. The General Manager went on to choose a more expensive configuration of the same brand of technology. The IS Operations/Infrastructure Manager explained:

We offered an option that was going to cost them [sixty thousand dollars] but the client came back and said, “No, No” … we were offering ten meg[abyte] wireless which is what has been round for a while … but the client ended up saying, “where does that leave us in terms of upgrade” and they know we have a one-hundred meg[abyte] link to [other sites] … so they were asking some questions that they didn’t necessarily technically understand but had heard some word around that “oh ten meg[abytes] isn’t quite as good as one-hundred meg[abytes]” … that sort of thing … so I guess that influenced the decision to go with fifty-four meg[abyte] radio gear.

While technically the increased infrastructure speed was not a requirement, the client went ahead and selected it. When asked how the customer became aware of this technology, the IS Operations/Infrastructure Manager responded:

The GM, who happens to be close friends with the techie guy, who lives in the same street, … obviously over time some of the technical talk has rubbed off to the GM and he knows some of the things to ask for.

The decision making process was regarded as well structured and consultative. The IS Operations/Infrastructure Manager noted that:

We constantly kept the client up to date and informed and given them the right to make the decision ... we gave them four options ... we even recommended an option that we thought was acceptable for the site ... but it was still at a discussion paper stage ... but we went back to the client and said this is what we're thinking, these are the constraints and they were more than happy to spend an extra [forty thousand dollars] on the site to get them to another level in terms of the technology they were going to be using ... we may never have recommended spending another [forty thousand dollars].

However, she believed that the process could have been improved. She stated that:

One of the decisions that we made ... the solution that we ultimately went with, we made a decision based on some information that was incorrect and that delayed the project by two months.

This decision premise had been based on inaccurate information from the supplier. In retrospect, the organisation acknowledged that this should have been validated before being relied on so heavily. The IS Operations/Infrastructure Manager stated that:

The supplier had told us that ... this equipment would be in the country in such-and-such a date ... we could have gone with another solution that wouldn't have been as good ... [mixed technology solution] ... in the end, we decided that, and we could justify it, that a [Product] solution for that site (preferred option) meant that we could support that site better because we already have the [Product] skills in-house.

Personal opinions had an influence on the decision making process, although not necessarily in a direct way. The IS Operations/Infrastructure Manager explained that her opinions shaped how the evaluation team worked, stating that ‘I think I did influence [my technical staff] in terms of my thoughts and I being [their] manager’. The Operations/Infrastructure Manager believed that her team’s opinions had a strong influence and dictated the standards that constrained the type of options and advice the staff provided.

4.3.4 Information sources

This section examines the information sources used in the two decisions. An organisational comparison and summary of these information sources can be found in section 4.4.2 (see page 133).

4.3.4.1 Business intelligence suite information sources

A mix of internal and external sources of information were used to inform the decision making. External sources included consultants and members of other organisations. Vendor supplied documentation was an important information source, with the Analyst Programmer stating that the decision makers had ‘relied heavily on the supplier’s own documentation and white papers’. The Business Systems Project Manager supported this, stating that he had used information from the Internet, sales literature from vendors and information from consultants.

The senior decision makers, the IS Manager and the Business Systems Manager, relied on the advice and experience of the development team. The Business Systems Manager remarked that a ‘corporate memory’ from the previous implementation had been established, stating that:

We had gained a lot of in-house, a lot of inherent knowledge about how this data warehouse was constructed and the info that should be going in there ... so we believed we'd been given a better understanding in a lot of ways than the vendor did on what this database actually looked like and how it related to other bits within.

From this data, it appears that senior decision makers relied more on internal expertise and advice while junior decision makers used more external sources.

4.3.4.2 Infrastructure upgrade information sources

Similar types of information sources were used for the infrastructure upgrade project. Information from suppliers, users at other organisations and internal technical staff were nominated sources. There was also evidence that the internal expertise removed the need for an extensive information gathering exercise.

4.3.5 Decision justifications

This section examines the justifications provided for the decisions in the two projects. An organisational comparison and summary of these justifications can be found in section 4.4.3 (see page 133).

4.3.5.1 Business intelligence suite decision justifications

Justifications for the selection and design of the business intelligence suite were assembled in a formal business case, which was nominated by interviewees as the key justification for the decisions. The business case stemmed from the organisational need for reports from the ERP system. Demands from the user base led to management pressure to act on, as the Business Systems Manager put it, 'the pain people were feeling'. Users needed to be able to obtain accurate data in a timely manner and this was the motivation for the re-implementation.

Functionally, the products under consideration for the reporting tool were similar. Two products existed in the market place, Product A and Product B. As the Business Systems Project Manager noted, ‘both products could do what we wanted’. One of these products, Product A, was already widely used in the organisation and a heavy investment had already been made in training. This was nominated as a partial justification for its selection. Product B was slightly more expensive, although potential savings to the business were never quantified. The IS Manager believed that most of the benefits were non-tangible. He went on to add:

You can put in this wishy-washy sort of crap where it’ll save people twenty minutes a day and three-hundred and fifty people and thirty dollars per hour plus twenty percent on-costs and add up and multiply all these and say it’ll save us twenty million dollars over three years which is just bollocks ... you can justify anything like that ... I wouldn’t insult the steering committee by taking stuff like that to them. If we put cost savings in there [the business case] they’re real and genuine ... beyond that, I put a verbal description of the world with this [initiative] and the world without it and let those guys weigh it up and justify if it is going to add value to the business.

In the final selection, the presence of Product A in the organisation, alongside its ability to match the competitor’s functionality, was enough to justify the decision. The Business Systems Project Manager explained ‘Once [Product A] could prove that it could do what we wanted, [Product B] was really up against it because we already had [Product A] in the company’.

While these factors were documented in the business case, there is some doubt as to the value of the documentation in the decision making process. As discussed in section

4.3.3.1 (see page 109), there was evidence that business cases were retrofitted to decisions in this organisation. For example, The IS Manager explained that he made a decision based on gut feeling and then would ‘build a business case and put all the analysis around it to support what intuitively is the right way to go’.

4.3.5.2 Infrastructure upgrade decision justifications

A formal business case was generated that provided primarily tangible technical justifications for the infrastructure solution adoption. These centred around existing ‘in-house’ technical skills for the product and compliance to the existing hardware and software standards in the organisation. Relationships with the vendor provided the second group of justifications. These included existing relationships with the product vendor personnel, known levels of support from the vendor, and confidence in the vendor. These justifications were clear, yet it should be noted that at no time was the information or intervention of the General Manager at the remote site disclosed.

4.3.6 Decision factors

This section examines the factors nominated as having directly affected the decision makers’ decisions in the two projects. An organisational comparison and summary of these factors can be found in section 4.4.4 (see page 134).

4.3.6.1 Business intelligence suite decision factors

The organisation used a blend of primarily contextual and intangible informational factors to shape the business intelligence suite decisions. Contextually, the decision making occurred in a politicised environment that made the decision makers aware that their decisions could be challenged and overturned. Supporting earlier comments by the IS Manager, it was important that most, if not all decisions taken to the steering committee were ratified in order to maintain confidence in the IS group. The IS manager noted that in that instance, the ‘organisational pain being experienced’ created

political alignment with the decisions he made. He believed this made the approval process easier, but went on to explain this was not always the case, stating that:

They were likely to approve the [business intelligence suite] because of those political pressures. But sometimes it goes the other way and that's hard. When I align with what the political pressures are, that's fine, but ... when ... they don't align though ... when I've got board pressures and things ... when they've got ulterior motives that's when it's hard. Sometimes it's quite subtle. We've got a managing director for example, who happens to be the managing director of [an ERP vendor] and they also sell an Australian developed ERP system ... he would very much like to see us throw out our current ERP and put in [the ERP] and that's a subtle thing that's going on in the background ... from his side, he probably sees value in seeing as much pain and difficulty in our current ERP environment ... so coming up with solutions and that ... he feels very negative about that ... probably because of some conflicts of interest I think.

The Business Systems Manager confirmed this, noting that 'A few people in [the decision making forum] had come from other companies who claimed to know all about EIS systems and were promoting other tools'.

The Business Systems Manager believed that politics in the form organisational pressure from competing business units was another contextual factor in the decision making process. He noted that:

Parts of the business would be very vocal when it came to making sure their own needs were met but were perhaps the parties most vocal in opposing or generating discussion on whether this paper should actually fly.

He noted that the composition of the committee also contextually affected the decision, stating that:

Decision makers were largely from the finance group yet the result of this paper [business case] was servicing the entire business ... really we were trying to convince finance group that we should spend money on other disciplines and maybe they didn't have a full appreciation of what was going on in those other disciplines.

The IT Solutions Project Manager also commented on the subtle power structures and politics within the steering committee:

Now I realise you've got to have endorsement from each one [steering committee members] before you can go to the board but having a steering committee that has a couple of general managers on it ... obviously one outweighs the other ... there's certain members on the steering committee that if they say something, it goes anyway, it's not an equal share in votes.

The steering committee consisted of members of unequal status and rank within the organisation and this affected the operation of the committee and the decisions it made.

The IT Solutions Project Manager remarked that:

One of the general managers is relatively new and he's still listening to the one that's been here a bit longer ... two of the members aren't even general managers so they lose out to start with.

Tangibly, factors such as cost, time and risk played a role in the decision making. Although these were mentioned, they were not regarded as key considerations. Less

tangible factors, such as the opinions of other employees, were seen as more important. It should be noted that while politics affected the decision contextually, the political viability of the option presented to the steering committee was also an important consideration.

One key intangible factor driving the process was potential negative organisational consequences. In order to maintain the confidence of the wider user group, the IS Group needed to deliver a good solution quickly. Decision makers had to take into account the short and long-term drain on resources that would be incurred by not addressing the problem quickly. The Business Systems Manager explained:

[We had the] knowledge [that] if we didn't do something, we were going to be reacting to requests and having to build things on a badly designed data warehouse that was effectively going to waste time and money. [We had the] knowledge that we would always be dependant on contract staff through that process. Unless we started providing our people with tools that gave them some power over their own destiny, we always were going to be expending contract, or our own staff, at the expense of other work.

In contrast to the stated formal decision making processes and documentation, there was the admission that a key decision making factor was perceptions or 'gut feeling'. This was used to make the decisions, and the analysis, business case and justifications were then retrofitted to match. The IS Manager explained:

I'm a perceptions type person ... based on perceptions, this is what I reckon I should be doing ... then I build a business case and put all the analysis around it to support what intuitively is the right way to go.

This data would seem to indicate that the decision maker was entering the process with a strong pre-decisional bias. The IS Manager confirmed this style of decision making by rating ‘gut feeling’ as the most important factor affecting his decision making, stating that ‘It’s got to feel right’. This is a significant admission given he was the most senior operational IS decision maker.

The decision factors identified indicate that within the framework of a culture of formal decision making, numerous factors were at play that negated or interfered with the process. Common themes were the need for political alignment, to maintain and build confidence in the IS group and the use of gut feel or intuition. Although tangible, transparent factors such as time and cost were used, they appeared to play a secondary role. It is clear that the decision making was a socio-political process that was more about building perceptions and confidence than evaluating solutions.

4.3.6.2 Infrastructure upgrade decision factors

Decision making surrounding the infrastructure upgrade was affected by a number of factors but was ultimately over-ridden by the General Manager at the site. Even so, in crafting a preferred option and business case, primarily contextual and tangible informational factors were used.

Contextually, as with the business intelligence suite decision making, the politics of the organisation was a background influence. The site had a history of problems as they had outgrown the existing infrastructure. ‘They had been hounding us … we had a lot of pressure on us to deliver a solution that would satisfy that site’, remarked the IS Operations/Infrastructure Manager. There was a need to keep the confidence of the user group and to be seen to be listening to their needs. The Operations/Infrastructure Manager went on to add:

The pressure is that they've been hurting for such a long time and the users out there are not happy with the solution we quoted them in the first place. The political pressure is actually pushing us to have a very conservative approach to the decision making.

Two inter-related tangible factors concerning time had an effect on this project. The first factor was the contextual element of the time frame of the project. This was related to the contextual pressure to deliver a solution to the site quickly. The second and key tangible information factor was the expected delivery date of the preferred option. Notably, neither factor appeared as formal justifications. The Operations/Infrastructure Manager explained:

We made [the decision] based on an element that was always going to be [time]. We had a time frame .. that we stipulated it had to be in by Christmas ... We found out that the [Product] gear was supposedly available and in the country and was going to make the time frame, we made the call that we'd go with the [Product] solution. And then when we hammered them about that date to make sure when we placed the orders ... that's when we found out that the information we were receiving was not totally as accurate.

When asked if the decision making would have been affected if this information had been known at the time, the IS Operations/Infrastructure Manager responded 'We probably have overlooked that option ... or, at the very minimum, we could have gone back and renegotiated with the client [regarding time lines]'.

Another tangible information factor was adherence to the corporate telecommunications strategy. The solution adopted was in line with the internal standards, with the IS

Operations/Infrastructure Manager remarking ‘That influenced me to say “yes, that the [Product] solution is the right solution for us”’.

As previously discussed, cost became unimportant when the General Manager at the remote site over-ruled the initial option for a more expensive configuration. This overt tangible political influence in the rejection of the initial option ultimately short-circuited the decision making process.

Decision factors in this project were again highly political. Although tangible information was considered, the decision making became a process of building user confidence through consultation. Eventually, this level of consultation ultimately shaped the decision outcome with the intervention of the General Manager. His decision making, as previously discussed, was based on external, informally collected information. Although the lead-up to the decision was rational, this project demonstrates that process may have little effect on a final selection decision. However, this does not mean that process did not have an effect on outcomes.

4.3.7 Decision outcomes

This section examines the outcomes from the decisions taken in the two projects. An organisational comparison and summary of these outcomes can be found in section 4.4.5 (see page 134).

4.3.7.1 Business intelligence suite decision outcomes

Outcomes for the organisation were mixed as a result of the decisions taken surrounding the re-implementation of the business intelligence suite. Primarily, these outcomes were resource related and had not affected either the decision making style or other decisions within the organisation. Even so, the IS Manager admitted that:

Every time you make a decision and start going down that path, as a result of making that decision things have changed and as a natural consequence, that's going to affect other things.

Resource implications were a particular concern of the Business System Project Manager, who remarked:

We bought a BI product, implemented it and we thoroughly underestimated the resources required to develop, maintain and improve it... It's now the largest product we maintain.

Organisationaly, the IS Manager noted that the outcomes were not 'a silver bullet' and the project 'wasn't a raging success'. Even so, the Business Systems Manager stated that the project had made 'quick wins' and reinstated confidence in the IS group. He then went on to qualify this by stating 'we made the only choice we could make'.

Although most decision makers supported the decision, some were concerned and felt that given the same circumstances, they would have considered other options. The Business Systems Project Manager believed that in retrospect, the initial transport tool selection, which affected the entire business intelligence suite design, was not ideal and that he would not have selected it. He stated that 'Experiences with the product haven't been great – it's been pretty buggy – it is not a key focus of the vendor so getting support and upgrades are hard'. He indicated that had he had the time and lack of constraints and pressures, it would have been far better for the organisation to examine the issue of a business intelligence suite as a single entity, remarking that:

If we're going to talk BI, let's talk the whole suite, you've got your [ERP], you implement that, if we want to do business intelligence, let us choose the whole

lot. There may have been a suite where the data mart or data transformation tool was so inherent in the front end tool, as in one product, you may have gone with the one suite.

The interviewee was commenting on the weakness in the strategy of examining individual components without looking at the whole system. Organisationally, the decision and the outcomes were seen as positive and were supported. However, the effects would continue to be felt for some time, as the IS Manager remarked ‘It will be years time before you’ll know if it has been successful’.

There are several themes in the relationships between the decision outcomes and factors that influenced them in this project. At the core of these are politics, alignment and trust between decision makers and units within the organisation. Organisational and political pressure to fix the reporting problem had direct relationships with the decision making process and positive outcomes. Due to political alignment with the decision of the IS group, the steering committee gave its endorsement and the re-implementation was able to begin. This meant the project was able to complete quickly and met the reporting needs of the users. However, it has been noted that in other instances, the political pressures and misalignment between the knowledge and understanding of IS group and members of the steering committee can lead to delays and less optimal organisational outcomes. It appears that politics and the composition of the steering committee can have both positive and negative effects on decision outcomes.

The competency and trust between the decision makers in the IS group provided the platform for a rapid decision to be reached, allowing the project to be commenced quickly. In that instance, delivering ‘quick wins’ was perceived as a positive outcome. As part of the process, junior members of the group were asked for advice and their recommendations were endorsed. The team was well integrated and understood the

problem. This permitted the use of opinion and intuition; however, because of the culture of formal decision making in the organisation, analysis and business cases had to be retrofitted to decisions.

This process highlights a problem within the organisation relating to trust. The need for internal trust and confidence was high, but trust between the IS group and the steering committee was only maintained under three conditions. Firstly, the IS group had to present business cases formally. Second, a high proportion of these business cases had to be approved. Finally, in order to keep approving the business cases, the projects had to be successful. In this instance, the need to quickly win back trust because of the first failed project meant that a full examination of all business intelligence suite options was not performed. This project became a quick-fix and the long-term outcomes from this are uncertain.

A related element to this was the political viability of the option. As previously discussed, the IS Manager stated that ‘If something goes to the steering committee, I want ninety-nine percent to be accepted’. This raises the prospect that the IS group were only promoting options that were likely to be politically viable at the steering committee level. While there were no observable outcomes from this behaviour in this instance, there is potential that politically riskier, but organisationally more beneficial options were not considered in the organisation.

4.3.7.2 Infrastructure upgrade decision outcomes

The outcomes from the infrastructure project were regarded as successful by the organisation. Users at the site were happy with the solution provided, even though the project did not meet its agreed timelines. The decision making process affected later decisions as more emphasis was placed on information verification as a result of the

vendor failing to provide the equipment on time. The decisions relating to the infrastructure upgrade project were supported by the organisation.

The positive decision outcomes from this project can be primarily attributed to the consultative decision making process and building the trust of the users at the remote site. Allowing the users to make the ultimate decision empowered them and built a better relationships with the IS group.

However, the direct intervention from the General Manager at the site has had mixed outcomes. From the positive perspective, the willingness to spend extra money on equipment with greater capacity than required gave the users a high quality system with room to scale. However, this direct interference confirmed that it is not uncommon within the organisation for a technical decision making process to be over-ruled or removed from the IS group. Perhaps more alarmingly was the General Manager's use of external, informal information sources to make this decision. This had the potential for negative decision outcomes.

4.4 Summary

The two projects examined in this case present a consistent view of the decision making processes and factors used in this organisation. A summary of the factors and outcomes in relation to the contextual decision making model is depicted in Figure 4-2.

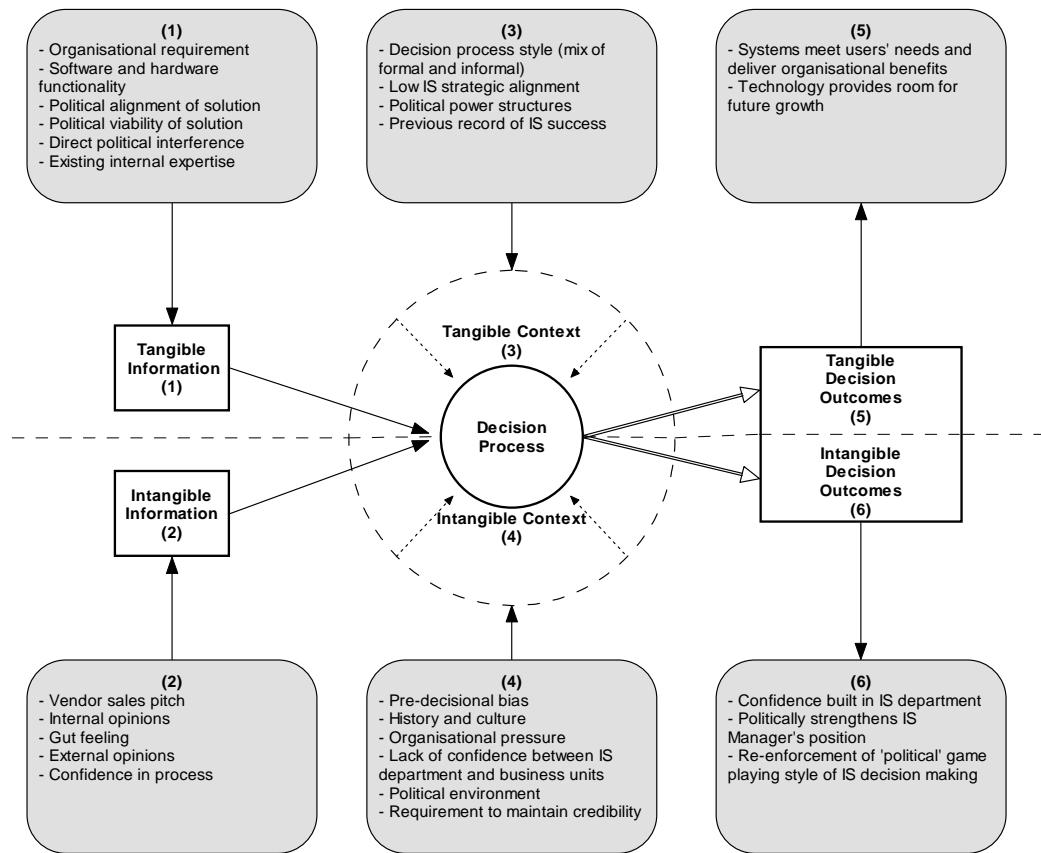


Figure 4-2 Summary of factors and outcomes within organisation A

The organisation presents an image of competitive business units exerting pressure on the IS group to meet their individual needs. It is clear that politics and power contextually shaped IS decision making, and that on occasions, technical decisions were taken outside the IS group. This section briefly summarises the key elements of the decision making within this organisation.

4.4.1 Decision making processes

IS decision making processes were categorised by interviewees as formal, structured and well documented. Moreover, interviewees were proud that IS in the organisation had moved from an 'ad hoc' decision making culture towards a structured approach. However, evidence suggests that much of the decision making was informal. Interviewees noted how decisions were taken by junior staff and promoted through management. The style used to assess the decision options considered by management

was informal, often categorised by ‘gut feeling’. Even if formal evaluation processes occurred, evidence suggests that higher levels of management were not unknown to over-ride the decision. Evidence from this case indicates that these high-level decisions could be taken based on very little information or information sourced informally from external sources.

Decision making processes, while superficially aimed at assessing options, were socio-political in nature. An important element of the processes was to build and retain trust and confidence in the IS group. Evidence suggest that this objective may not have always had positive outcomes for the organisation as it created a risk-averse IS group who promoted only politically viable options. However, this same focus built stronger relationships at the user level.

Much of the style of decision making can be traced back to how the IS group interacted with the rest of the organisation. It was a provider of services to a number of competing business units. Although the IS group may have had the ability, skill and trust internally to reach decisions informally, to survive politically it had to present formal justifications, even if these were retrofitted. This resulted from a misalignment of focus and understanding between the broader individual business units and the IS group. Each business unit representative on the steering committee acted for their unit to compete for a share of the IS resource allocation. This competitive approach to resourcing demonstrated a lack of understanding of the broad IS needs of the organisation and an inherent mistrust of how well the IS group would use resources. In turn, this led to a constant effort by the IS group to build and maintain trust. This was done by using formal business cases to justify IS projects, even though these had limited value in relation to how the decision was reached.

From these factors, it can be seen that the process used to reach a decision in this organisation was influenced strongly by politics with underlying themes of (mis)alignment and competition. Although attempting to meet the functional needs of the users, the IS group was often forced to operate in a political fashion to achieve their aims. This appeared to detract from the process and outcomes.

4.4.2 Information sources

A mix of internal and external information sources were used in the organisation. External sources included consultants, other organisations, vendor documentation and sales literature. Internally, opinions and expertise of staff and corporate memory were used. Interviewees gave the indication that they aware of information sources before they entered the decision making processes and few additional sources were sought. Notably, senior decision makers within the IS group used mainly internal data sources. Decision makers at higher levels acted on external, often informal, information sources.

4.4.3 Decision justifications

Justifications for decisions were clearly stated and formalised, though it should be noted that when high-level intervention occurred, this was not documented. Tangible decision justifications included functional match and compliance with existing technology standards and strategies. The presence of a vendor's product in the organisation also formed a justification, especially when staff were already trained in the use of the product. Cost was not a justification used in the organisation. Less tangible factors included existing vendor relationships and the levels of trust in the vendor, its product and the support provided. A key justification used in the organisation was the 'pain' users were experiencing and demand for problems to be resolved.

4.4.4 Decision factors

A combination of contextual and informational decision factors affected decision making in the organisation. Of these, the contextual environment played the most important role. Politics, power structures, composition of the steering committee and organisational pressure shaped the process and the way information was used. Trust, confidence and relationships were the over-arching contextual themes. In both projects, there was evidence of time pressure that also forced more rapid selection decisions.

Tangibly, cost, risk and adherence to organisational technology standards and strategies were nominated as considerations. The estimated time to complete the project was also a key consideration, as both projects needed to be completed quickly to restore user confidence in the IS group. In one observed instance, direct political interference changed the decision outcome and from broader feedback, this was not an isolated incident.

The political viability of options formed a key decision consideration. Although tangible, it was assessed with the use intangible factors such as ‘gut feeling’ and intuition. The potential negative consequences resulting from not acting were also key influences. From the actions of the General Manager at the external site and observations regarding the external relationships of members of the steering committee, informal external information sources and relationships also influenced decisions in the organisation.

4.4.5 Decision outcomes

Outcomes were regarded as positive from both projects, with users reacting positively to the reports and infrastructure. User and management confidence in the IS group was an additional positive outcome. This confidence appears to have been a priority desired outcome in both instances. This priority, in combination with the need to act quickly,

shaped and perhaps restricted the initial decision options in both projects. Evidence from both cases indicates that the levels of political interference had potential for negative outcomes, similar to those seen in the first business intelligence suite implementation.

4.5 Conclusion

This case has examined two contemporaneous IS projects undertaken in a private power utility. These consisted of a business intelligence suite re-implementation and an infrastructure upgrade. The organisation had undergone significant recent change in the way IS projects were managed and how decisions were made. A new, formalised, project-based culture had emerged.

The organisation had adopted structured formal decision making processes. Although these were evident, there were indications that these were applied after decisions had been made. Advice from junior decision makers was often used to shape decisions, which were made within the IS group by the senior managers, often using ‘gut feeling’ or intuition. Once decisions were made, analysis and business cases were generated to conform to the desired outcomes.

Decisions were influenced strongly by the highly politicised environment to the extent that only politically viable decisions were submitted to the steering committee for ratification. Political interference was not uncommon and was subject to the external relationships and information sources of high-level management. Although confidence was a key element to maintaining operation of the decision making process, it was the lack of trust between the competing business units and the IS group that created the political environment. The lack of alignment in the goals and understandings in the various levels at which IS decisions could be affected demonstrated potential for, and was evidenced with, negative outcomes. In summary, managing the socio-political

process while attempting to build and maintain trust and confidence was the dominant IS decision making factor in this organisation. Although the projects examined had positive outcomes, this factor was associated with negative outcomes in other instances.

Chapter 5

Organisation B

5.1 *Introduction*

A continuing problem associated with organisational reliance on technology is that as technology changes and becomes superseded, costly decisions are required concerning replacements and updates. This second case study examines such an event in a health care organisation. This chapter describes the decisions relating to the three million dollar purchase and implementation of a patient management system (PMS) and an associated financials module which occurred over a twelve to eighteen month period. The organisational history that provided the context for the selection and implementation is examined alongside the decision making process and information sources. This chapter focuses on explaining the justifications presented for making the decision as well as the factors the decisions makers nominated as having the most influence on the outcomes. Finally, the outcomes themselves are examined in the context of the data collected.

5.2 *Overview*

Organisation B is a not-for-profit health and aged care group based on the religious philosophy of care and charity. The group, spread over a number of facilities across regional sites, consists of three acute care, one aged care and other support facilities such as food preparation, laundry and central administration. The organisation was originally established in the early part of the twentieth century by a religious order and now has more than eleven hundred employees. As it has evolved, it has developed a corporate structure and is now almost entirely administered by the laity, although there remains religious representation on the governing board. However, the underlying philosophies

of care and charity are still at the forefront of the organisation and as one interviewee noted, ‘decisions are tested against the values of the organisation’.

5.2.1 Interviewees

Five interviews were conducted within the organisation relating to the three million dollar implementation of a patient management system (PMS) and an associated financials module which occurred over a twelve to eighteen month period. The interviewees consisted of the Group Chief Executive Office (CEO), the Group Executive Officer (EO) (Business), the Chief Financial Office (CFO), the Project Manager and the Information Systems Officer/Operational Project Manager. Each interviewee had a role in the process surrounding the system selection, be it as an information provider, a decision maker or both.

The Group CEO reported directly to the board and directly supervised a number of staff including the four facility CEOs, a CFO, the Group EO (Business) and a Chief Engineer. The CEO stated his expertise as being management and displayed a high-level knowledge of information systems (IS). His primary use of the technology was for desktop applications and as business intelligence tools to inform decision making. He believed that IS was strategically important in assisting with the provision of information in the organisation.

The Group EO (Business) directly reported to the Group CEO and supervised, indirectly, the Information Systems Office and the Group Purchasing Officer. He had a twenty year history with the organisation and an expertise in health administration. His duties included health fund negotiations, strategic IT management and assisting in ‘operationalising ideas’. The interviewee used IS extensively, noting its importance by remarking that he used it ‘every moment of the day’. He associated IS with productivity

and saw its strategic role as ‘managing and administering patient information in as a productive a way as it is possible to do [for the organisation]’.

The CFO reported directly to the Group CEO and supervised the accounts payable, accounts receivable and financial officers. She had over fifteen years with the organisation with an expertise in financial management. The CFO had a broad understanding of the needs of the organisation at every level, having progressed upwards through the organisation. She remarked that ‘I’ve got a very good handle on the day-to-day operations as well as I’ve come up, … worked in the lower ones as well’. Her duties included overseeing all financial and management reporting functions in the organisation, monitoring investments, advising the CEO and reporting to the board. The CFO was IS proficient and used it extensively for financial system management, remarking ‘I can access anything myself and like to get to anything if I want to get to something’. She saw IS as strategically important for the organisation, noting that ‘If you don’t have good information, you can’t make good decisions’.

The Project Manager was contracted for the period of the project while on leave from his substantive position in a government health service. He reported to the Group EO (Business) and supervised all members of the project implementation team. He had conducted an ongoing professional relationship with the organisation since 1998 when he was retained to provide advice on a year 2000 (Y2K) upgrade. He was able to save the organisation a significant amount of money through this engagement and his negotiation with vendors. He believed he had built up a strong trust relationship with the organisation. He stated that his expertise was IT project management and during the project, his duties included product evaluation, product verification, contract negotiations and implementation management. He displayed a strong understanding of IS and was comfortable with technology. He believed that IS was strategically

important for the organisation and noted that ‘their financial viability depends on the information on billing, on negotiations with health funds, on cash flow et cetera’.

The Information Systems Officer reported to the Group EO (Business) and supervised technical staff at each facility. The Information Systems Officer had been with the organisation for thirteen years. She noted that ‘she started at the very bottom’ and progressed through a number of administrative and operations roles. At the time of the interview, the interviewee had been in her role three years, but had previously been involved in the management of hardware and software as the payroll clerk and the financial reporting supervisor. Her expertise was technical operations although this had evolved towards management as the complexity of the IS operations at the organisation increased. As such, her duties also included operational management of all IT services for the organisation. The Information Systems Officer believed that IS was critical to the organisation. She noted that ‘if you don’t have information, if you don’t have a good system that can give you timely accurate information in a way that’s meaningful and relevant to people, you can’t manage a business’.

5.2.2 Organisational history

Historically, the organisation relied on IS for the management of patient records, financial systems, business intelligence, human resources, payroll, inventory control and clinical systems. IS was directly supported by a small team of technical staff, one per facility, and coordinated by the Information Systems Officer. The model of support was user-centric, with little evidence of bureaucratic technology services or infrastructure. Users’ needs were well understood and there was little or no appearance of hostility towards technology or its support staff in the organisation.

The key patient management and financial systems, although separate software, were semi-integrated and were centralised on the same physical system. A functionally

decentralised approach was taken to task distribution whereby each regional centre specialised on a particular financial function to avoid duplication. This model created an organisational context in which the introduction of new IS could potentially require people to be re-skilled or relocated if the system was unable to align with existing processes.

The organisation had a relatively limited history of IS projects even though IS was used extensively to support its operations. The interviewees noted that there really had not been a major project since the introduction of the first patient management system in 1984. Even so, the organisation had a history of success in its IS projects. Most projects were conducted with the assistance of vendors and contractors. There were not any IS project failures, although some of the smaller projects had some minor implementation teething problems. Interviewees noted that these were small projects that occurred some time ago and for the most part, were not remembered by the wider organisational community. However, interviewees were wary of how their selection decisions could shape organisational outcomes. They were particularly aware of the effect of sales pitch after the purchase of an asset maintenance system that failed to function as expected.

The CFO explained:

Sometimes you get caught up in the salesman's pitch of things and it's really easy to make a test system look really spectacular and do everything you want, but then sign on the dotted line and get it and you don't really get sometimes what you wanted to get. It doesn't always do what you wanted it to do.

The system technically delivered what was promised, but the perceptions generated by the sales team were not met. As the CFO stated 'It could do it but couldn't do it properly'.

5.3 The patient management and financial systems project

The first patient management system, also known as legacy software, was introduced in 1984 and was based on terminal-based technology. This system was maintained and upgraded in response to changes in the health care industry and government regulations. As well as patient management functionality, the product contained an integrated financials module used for billing, accounts payable, accounts receivable, general ledger and assets. During the life of the legacy software, it went through four software vendors. The second last vendor signalled their intent to de-support the product and gave users four months notice to migrate to another product; however they rescinded the deadline and continued to support the product due to pressure from its larger users. Finally, Vendor A, the final owner of the legacy software, announced the date at which it would no longer be supported and offered a replacement system, Product A. As interviewees noted, the ‘old system worked fine’ and it ‘was a very stable system’, just that it was no longer supported.

At an organisational level, there were additional pressures that were motivating change. The hardware running the legacy system was out of warranty and the Information Systems Officer, describing the general feeling amongst key users, noted that ‘It was time to make a change anyway’. The end of support for the product caused an overall review of the organisational requirements from a patient management system with the Information Systems Officer noting ‘[the de-support of the legacy system] caused us to say “hold on, we’ll look out there and just make sure that [Product A] is what we’re going to need or maybe there’s something better and there’s an opportunity to change and make improvements”’.

The Group CEO saw the project as a chance to determine what resources should be invested into IS stating that ‘[we] could not get any benchmarks on what we should be spending on IT’ and ‘[the] drive was to as an organisation were (sic) to be properly equipped for better and more timely access to information’. At this time, a project team was formed to evaluate patient management systems.

Four options were considered. Product A, produced by Vendor A, the maker of the legacy system, was a graphical user interface (GUI) based tool run on a modern operating system and clustered hardware configuration. Product B was based on legacy technology with a world wide web (WWW) browser-based interface. Two other products (C & D) were nominally evaluated, however these were never seriously considered. The Group EO (Business) stated that ‘There was really only two we evaluated because there were really only two in the market place but they also had had expertise in that way’.

As a result of the evaluation, Product A was chosen as the preferred option. However, while Vendor A had provided a replacement option, this did not include an integrated financials package. Vendor A did offer a separate financial system that integrated closely with their product, although it was based on United Kingdom market requirements. This product was not regarded as entirely suitable: ‘When we did the evaluation, we would say that the financial system didn’t have the same robustness of the patient management system but we went for integration over that’, noted the Group EO (Business). The vendor later withdrew the product, offering an alternative from another vendor with custom interfaces to the patient management system and this was accepted by the organisation. The CFO noted that there was not an evaluation performed on the finance system. The selection of this system was a follow-on decision as she explained:

I guess we were a bit pre-locked into the financials we went to, as we'd started on the patient management system, they had made a decision on the system we were going for, and that group had a particular financials package ... it wasn't until we'd gotten part of the way down the track that they pulled out and offered an alternative financials package ... so we really just took that and went through an implementation study with them.

5.3.1 Decision making process

The decision making relating to the project occurred at a number of levels. Starting with user consultation and evaluation groups, decisions were then taken by the project managers, ratified by the Group CEO and Group EO (Business) and taken to the board of the organisation for final approval. A group of key decision makers and information providers, made up of the interviewees, led the decision making process. A strong theme in the way in which the organisation approached the process was consultation and consensus. The CEO stated that 'The work we did in evaluating and trying to bring the staff with us went on and on for months'. The Information Systems Officer stated that:

Everybody had an opportunity for input ... there was a survey done and everyone was asked for their preference and for what reason ... and then all of that information was collated ... at the end it really wasn't a decision ... it just fell into place.

The indication from the interviews was that the evaluation process was not so much about evaluating products as effecting organisational change and user acceptance. The Group EO (Business) stated that 'The culture of our organisation is consultative so this process was consistent with this'.

As part of the way of controlling the consultative, change management process, there is evidence that the number of decision alternatives considered was restricted. Decision makers were aware of what products were available and had already formed views on their suitability to the organisation. This satisficing behaviour is consistent with Simon (1967b) and his observations that once the aspiration of a decision maker has reached the level at which there are an appropriate number and quality of decision alternatives, the search for alternatives stops. This alternative limitation resulted in the Information Systems Officer observing that ‘It wasn’t a hard decision to make in the end as there were not a lot of choices. It was quite obvious at the end’.

Although the decision making was seen as consensus driven, the decision making process was categorised as formal by the Group CEO, the Group EO (Business) and the Project Manager. The Group CEO noted that ‘the rigour that the staff applied to evaluate the systems that were on offer was tough’. The Group EO (Business) explained the process as:

When we did the evaluations, we had weightings and point scoring and that type of thing and we presented findings like this one was evaluated at five and this one was evaluated at nine ... and ultimately we came up with a weighting system and that provided at least a quantitative evaluation of the judgements made of the people who did the scoring. From there, there was then a cost evaluation and then also a look into other users and their experiences.

The Project manager noted the need to formally evaluate key aspects of the proposed solutions, remarking that ‘we made sure it covered all bases in terms of product evaluation, performance reference sites, company viability’. This was supported by evidence of documented evaluations and reports. The remaining interviewees regarded

the process as ‘somewhere in between [formal and informal]’ given its consultative nature. The Information Systems Officer stated that:

I don’t think it was overly formal, but I don’t think it was very casual either. I think it was made that way so that everyone felt that they could have their say without feeling threatened.

There were generally positive and supporting comments about how the decision making process was executed, with the Project Manager stating that ‘compared to other organisations, it was a fairly streamlined process’. However, the lack of the decision making process concerning the finance system selection was seen as a weakness that may have led to less than ideal outcomes for the organisation. The CFO explained:

I’d like to have had the time to investigate more systems because we didn’t know if there was anyone else out there that could have supported or interfaced with us as effectively as we believed [the selected financials product] would. We now know of at least one other player out there who could have done.

She repeated this concern at another point in the data gathering, stating that ‘if you were doing it again, you’d obviously evaluate more than one system’.

Interviewees had mixed opinions when it came to assessing to what degree their personal opinions and knowledge affected the decision making process. The Group CEO stated that he relied more heavily on what his staff advised him. He acted primarily on advisement from his Group EO (Business), CFO and Project manager. From their advice, he prepared a decision for endorsement at the board level of the organisation. There is no evidence to indicate that he, or the board, acted politically in any way in order to influence the advisement.

The Information Systems Officer saw her role as assisting the consultative process rather than actively influencing the decision, remarking that ‘it was a group thing’. The project manager was of a similar opinion, believing that while his opinion had some impact, it did not have a strong influence. His role in the project was to provide expertise in systems selection and implementation, not to take the final decision. His experience and external relationships added another dimension to the decision making.

Vendor A was aware that on completion of the project with Organisation B, the project manager was due to return to his role in government to implement a similar, but much larger project. The project manager remarked that, in order to establish a trust relationship, Vendor A was:

Keen to do the right thing at the trial site [the organisation] as they were keen to sell the product to [the government health agency] and they knew that I’d be returning with good stories rather than bad stories.

From this it is clear that although the project manager may have believed he had little impact on the decision outcome, his presence contextually affected the way in which one vendor interacted with the decision makers.

The CFO and Group EO (Business) both thought their opinions affected the decision significantly. The CFO stated that that her opinion affected the decision ‘a fair bit... [because] at the end of the day if I’m overseeing the system then I want it to work for me’. The Group EO (Business) was more direct:

I’d have to say I was very biased towards the [Product A]. I had seen it a long time before anyone else and got to know it better than anyone else and I could

see, because I was strategic in my thinking, that it was going to take us further than the other product.

In order to have a project of this nature really bedded and accepted and not be criticised for thrusting something on the organisation, and let's face it, an IT system is an integral part of the organisation, for an individual to be sort of self gratifying and justifying it, even though it may be the consensus view ultimately, for an individual to do that, ... an organisation needs to be a bit broader in its input in those types of decisions.

This view indicates that while the Group EO (Business) had clear views regarding which product he wanted the organisation to use and why it could be justified, he was aware of the change needs of the organisation. While steering the decision in the direction he believed was correct, the Group EO (Business) created an engagement process with the users. This process, though described as consensus decision making, was a method used to move the organisation into a position of acceptance of the Group EO (Business)'s preferred vendor.

5.3.2 Information sources

A limited number of rich information sources were used by interviewees during the decision making process. Interviewees primarily obtained their information from vendors, either verbally or in product documentation. One key alternative information source was site visits and referee reports from other organisations who had implemented the products under evaluation. Further information was obtained from focus groups, members of similar organisations, government policy documents, the internal needs analysis, key users and practical demonstrations. As the most senior decision maker below board level, the Group CEO remarked that 'I was swayed by the input from existing users or those that had already performed the evaluation'.

The organisation benefited from the cooperative, collegial nature of the not-for-profit health sector in that members of other organisations were willing to provide information freely and even assist in the evaluation process. The sector has considerable contextual similarity between individual organisations which leads to information sharing in decision making. The Group CEO and other decision makers recognised this by their willingness to engage, accept and value the opinions of users at other sites.

5.3.3 Decision justifications

Written justifications for the selection of the patient management system (PMS) were prepared as part of the selection process, with the score carding forming the basis of the recommendations. It should be noted that no formal justifications were documented for the financials component of the project.

Justifications for selecting Product A were broadly categorised into three groups. The first group centred on the product's ability to perform the required task and meet the goals of the organisation. The group CEO noted that the selected product demonstrated good usability and that this was important as 'we had to be able to use it and get access to information we wanted quickly'. Although this was important, there were not substantial differences between the products that were evaluated. However, the decision makers were keen to avoid the potential of another legacy system, so the modernity of Vendor A's product had significant appeal.

The second group of justifications concerned existing relationships with the vendor and the confidence that the organisation would be given appropriate support. Although the purchase contract included penalty clauses for failure to deliver support, the organisation was sensitive to the need to establish and maintain a strong relationship with the vendor. Key themes from the interviewees included trust and confidence. They believed that the

existing relationship and confidence they had with the preferred vendor was an important justification for choosing them again. As the Information Systems Officer noted:

We'd worked with these people; we knew how they interacted with us. We could trust them. We knew if they said they were going to do something, that it worked and that they'd do it.

The final group of justifications were rebuttals of the other products and concentrated on perceived problems or weaknesses. As an example, the Group EO (Business) stated that:

We were not unfamiliar with the competitor, because part of the evaluation was [that] the representative from the opposition sites come to the software evaluations of both products ... Their scores counted to the ultimate outcome we had ... and we did a review in the early 1990s of [Product B] and the product we saw in 2000 was no different than the one we saw several years ago except that it had a web browser over it. We were not convinced that a legacy product with a web browser on it would give us the advantages and the information together as going with [Product A].

The degree of vagueness in this style of justification made it possible to have categorised it within one of the first two groupings. However, on closer analysis, it was clear these justifications were perceptions of functional or strategic weaknesses rather than explicit identification of specific flaws.

It is clear that although functional and strategic issues were used to justify the decision, the justifications were limited. Interviewees were generally unconcerned with justifying

the selection decision and were more interested in highlighting the importance of the consensus driven process and the outcome. Even so, there was a commonality in the belief that the selection of Vendor A was justifiable because of the trust relationship that had previously been established.

5.3.4 Decision factors

A combination of influences and factors shaped the decision making process and the outcomes. Contextually, the consensus based decision making process was a result of fears of job losses and the uncertainty surrounding the introduction of new technology. The Group CEO believed the cultural and political influence of the threat of job losses resulting from the implementation of a new patient management system led to a more inclusive, reassuring decision making process. This calls into question the decision making value of the process when it is consistently referred to in terms of change management.

Indeed, the Group CEO did not really believe there was a decision in the end, as he nominated a ‘lack of alternative’ as one of the influencing factors. He went on to explain:

Look, there might have been three or four systems we started with and each time we narrowed it down, we dropped one off the list because we thought it would not deliver what we wanted. We didn’t want to go from one system to another and not gain anything ... not have spent all that time and money and not come out the other side not being able to access the information we needed.

This raised the question: was the decision making process designed to cause this effect? As previously discussed, the Group EO (Business) believed that Vendor A was preferable, clearly reiterating this with the comment that the ‘incumbent was first cab off

the rank'. This pre-decisional bias towards the incumbent vendor shaped the process and the outcome. This sentiment was supported by a comment from the CFO, who noted that there was always a 'lean towards them'.

Other more tangible factors were nominated as factors that influenced the decision making. The project manager noted that technology maturity and long-term technological viability were important. The Information Systems Officer agreed and noted the strategic requirement of the ability to cope with growth and expansion. This required careful consideration of factors such as the hardware and software attributes of the products.

This awareness of strategic alignment and requirements was supported by the Group EO (Business). He believed that the selected product was strategically aligned with the needs of the organisation. He noted other contributing factors including how easily data could be migrated, the size of the market share of the vendor and the distance from, and the size of, the vendor support team. The CFO was also concerned with product functionality and compatibility issues. Although cost was mentioned by a number of interviewees, it was considered a minor issue.

Of the less tangible factors nominated, the Group CEO nominated the 'suitability of the option' as to how well it 'fitted' with the organisation. The Information Systems Officer supported this by nominating the level of cultural alignment between the product and the existing business practices as a key factor. Both believed the product needed to achieve efficiencies while conforming to the organisation. The human aspect of the decision was important, and the CFO believed that the opinions of other users of the products were influencing factors. She stated that she listened to 'what other people had to say about the product ... not what the salesman was saying about the product'.

Of all the factors examined in isolation, all interviewees rated the relationship between the organisation and the vendor as the most important. The Project Manager explained:

A big part of it initially was the relationship ... one of the biggest things ... you need to get a feel whether you're going to be there in ten years time with these guys ... certainly cost is a major factor but it's not the highest factor ... the fact that they were going to be a good partner for ten years was probably one of the highest things ...you get a gut-feeling of how they behave and their history at other sites.

The Group CEO confirmed this with his comments on representatives from software vendors by remarking that 'You get a sense... a gut instinct ... about how supportive these people are going to be'. The CFO rated the level of vendor support as the most important deciding factor. She explained that:

At the end of the day if you have two products that stack up fairly well and you know that their old support has been good, then you are going to go with the one that you know.

The project manager described the importance of trust between the organisation and the vendor, even if the 'trust' was contractually enforceable: 'it came down to we believe we've got a partner who we can trust and will perform whether out of good will or contract fear, at the end of the day, didn't matter'.

Overall, the confidence built by the decision making process and the trust relationship formed the capstone factor to the decision. The Information Systems Officer noted that there was a belief that the selected product would be 'a system that could take us where

we need to go ... [and would] provide for us the system that health care was going to demand in the future'.

The common themes in these factors are support and trust in the vendor and the confidence that the system will be able to cope with future needs and requirements. Interviewees repeatedly discussed themes of vendor alignment with the needs of the organisation and how well potential vendors would interact and respond. It is clear that although strategic and functional factors were important in making this decision, numerous human factors shaped the process and the outcomes.

5.3.5 Decision outcomes

The decision outcomes affected the organisation in number of positive ways. The experience gained from the decision gave the organisation confidence in handling future decisions. The Group CEO believed this promoted organisational awareness of the size and resourcing required for such projects. The Group EO (Business) envisaged that the consensus based evaluation process would be adopted for other large capital investment projects in the organisation. The Information Systems Officer summarised by explaining that the decision to implement the system had given the organisation a corporate focus:

The fact we went this way and we decided that we needed to know, as an organisation, what things were costing us, what revenue we could ... basically to get efficiencies, it was best to work as an organisation so then there is a spin-off so every time there is a new need for a new system, we look at it as an organisation.

Operationally, the system delivered immediate positive outcomes and efficiencies. However, the Project Manager stated that as a result of the project, many smaller,

planned projects, had initially stalled or had been delayed at some cost to the organisation. The CFO was cautious about being bound to a particular technology as a result of the decision. She noted that the decision would affect future software systems selection as they would have to share the same hardware platform.

The CFO was the only interviewee to express concerns about the long-term implications of the decision. All other interviewees believed that, faced with the same decision, they would have made the same choice. However, the lack of decision making concerning the finance system selection had worried the CFO. She had felt the automatic adoption of the single option had possibly been a mistake, and when asked if she would have acted in the same way with the same information, she stated that:

I don't know – may not have. You never really know a product until you have it in place and have it set up ... maybe there is something that may have been better.

Although most of the organisation embraced the new technology, some staff still had problems adjusting to the new system. Although the consensus driven evaluation was designed to minimise fear and change resistance, the CFO noted:

The good hasn't come without pain. Someone had a particular position and role they used to play and even though it has been better to change what they do, they might not really have liked it.

Even so, this was not an organisational-wide response and the general perception was that the outcomes were positive in the long-term. The Group EO (Business) summarised this sentiment with his statement:

Over time the acceptance of the system ... over the first six months, all the system did was cop criticism ... and that was part of the change management ... having got it in and having identified some of the weaknesses and working with the vendor to overcome those weaknesses and getting credible output ... there are still nuances that we're not satisfied with but generally there is a good feeling about what we've got.

A number of inter-related factors had direct relationships with the decision outcomes. Operationally, the system delivered the functionality that was promised and this led to positive outcomes. It aligned to the strategic needs of the organisation and delivered the efficiencies and future viability that was required. Therefore decision factors such as functionality, strategic alignment and future viability were important and their consideration had positive outcomes.

Contextually, the style of the decision making was a critical element of acceptance. The culture of the care and inclusiveness in the organisation created the consensus driven approach that minimised fear and created acceptance. This can not be underestimated in this context, as the project was large, involved a small implementation team and relied on the good will and cooperation of the users.

Trust formed another key factor. This element operated in two ways: internally and externally. Internally, there was a high degree of trust amongst the decision makers. Even though it appears that much of the decision making had occurred before the broader consultation began, the process was engineered to engender trust between the users and the final outcome. In other words, the wider organisation believed that the decision would be the correct one. This confidence in the decision led to a more acceptance of the system. Externally, trust in the vendor was a key decision factor. The assessment of the trustworthiness of vendor and how strong a relationship could be built

and maintained was the most important factor interviewees discussed. Without assessing this factor correctly, the outcome from this implementation could have been very different.

5.4 Summary

This case presents an example of an organisation that used a structured evaluation process within a consensus driven decision making framework. However, the case is rich with contextual influences that shaped the process and the outcomes. A summary of the factors and outcomes in relation to the contextual decision making model is depicted in Figure 5-1.

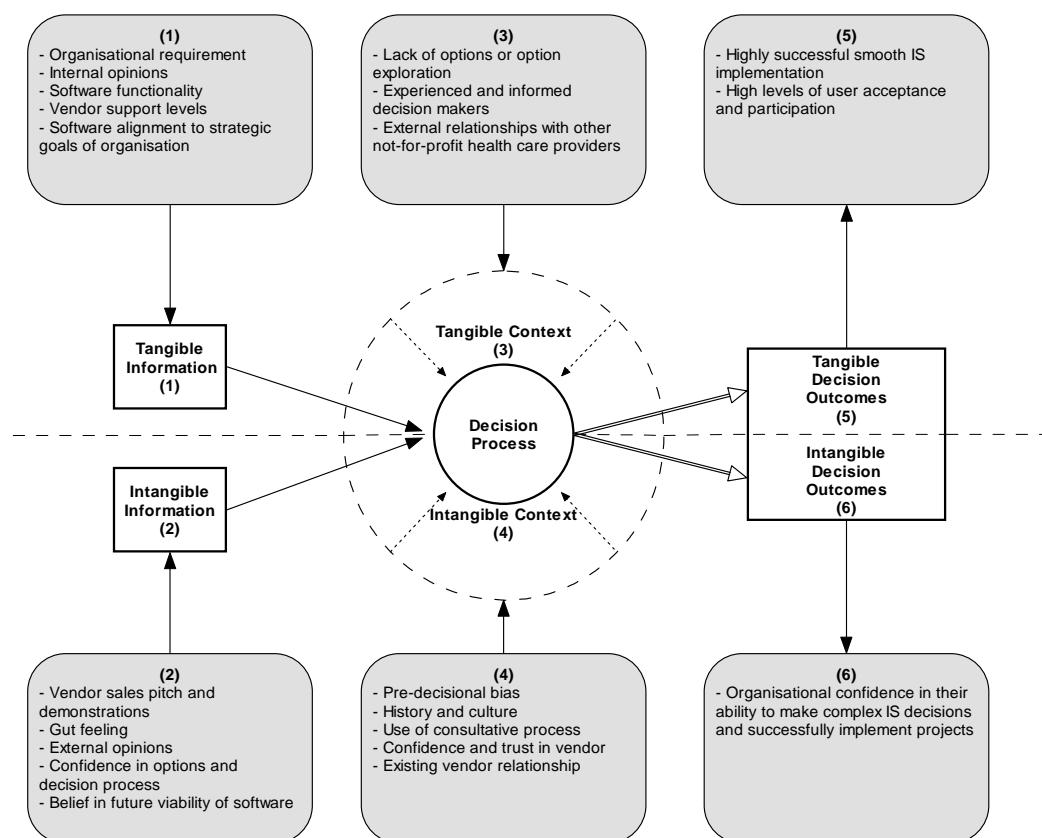


Figure 5-1 Summary of factors and outcomes within organisation B

From this case it is clear that process can be just as important as decision outcomes in order to achieve positive results for an organisation. This section briefly summarises the key elements of this case.

5.4.1 Decision making process

The process undertaken in this organisation to reach a decision was, according to the interviewees, consensus driven. However, there is considerable evidence that the key decision makers had formed a pre-decisional bias towards the incumbent, Vendor A. This presented a set of circumstances whereby decision makers felt little uncertainty and were satisfied with the options that they were aware of. However, decision makers were also acutely aware of the culture of the organisation and knew that a decision without extensive consultation and user buy-in would potentially complicate or cause the failure of their PMS implementation. As such, they created a decision making process that was consensus driven. However, effectively only two options were provided, one of which was, from a user perspective, far less attractive.

Although this may appear to be a cynical manipulation of the organisation, the objectives were clear. A system had to be selected quickly and user buy-in was essential. The key decision makers were already cognisant of some of the technologies available and had developed confidence in a vendor. There were no negative results from using this process.

5.4.2 Information sources

A small but rich number of information sources were used to inform the decision making process. The information sources that created the pre-decisional bias in the key decision makers were also used transparently during the evaluation. These sources were primarily the opinions and experience from other similar organisations. Additionally, information sourced directly from the vendor was used in the process. Given the low level of uncertainty surrounding the decision, it seems unsurprising that additional information sources were not sought.

5.4.3 Decision justifications

Justifications for the selection decision were clearly stated, although formal justifications were not provided for the finance component of the implementation. Tangible justifications included the functional match with the needs of the organisation, usability of the product and its long-term technical viability. Less tangible factors included the need for a good relationship with the vendor and the perceptions of failings in other options. Of these justifications, the issue concerning vendor relationships formed the strongest justification.

5.4.4 Decision factors

It is clear that an interactive mix of contextual and informational factors led to the decision outcome. The difficulty in this case arises because of the strong level of pre-decisional bias that indicated a selection had already been made, contrasting with the culture of the organisation that resulted in the consensus driven decision making process. Ultimately many of the factors that shaped the pre-decisional bias were also nominated by the interviewees as factors considered in the decision. This appeared to be the case, as the awareness of the preferred vendor, the existing relationship and the opinions from other organisations were all openly discussed. For example, the Group EO (Business)'s comment that 'I'd have to say I was very biased towards the [Product A]. I had seen it a long time before anyone else and got to know it better than anyone else' would seem to support this view.

However, interviewees nominated a range of factors that were considered during, if not before, the decision making process. Many of these were tangible and included cost, functionality, strategic alignment and future viability. Of these, the functional and strategic alignment were regarded as the most important factors. Less tangibly, the key decision factor was the level of trust in the vendor. The organisation acknowledged the need to build a relationship with the vendor in order to implement and maintain the

product. Their existing knowledge of the vendor and its staff was an important element of this trust. Overall, this human factor was the most important consideration in the decision.

5.4.5 Decision outcomes

The organisation experienced positive outcomes from the decision. The vendor provided excellent support during and after the implementation. The decision gave the organisation confidence in their abilities to make decisions and implement large projects. The consensus driven approach minimised organisational resistance to the new system. The decision makers were generally satisfied with the process and most believed they would take the same decision again under the same circumstances.

5.5 Conclusion

This case has examined a technology selection decision facing a health care organisation. The organisation had a small number of technical staff and a history of successful IS projects in the organisation. The organisation's patient management system required urgent replacement due to its age and de-support deadline from the vendor. The organisation engaged in a structured, formal, decision making process. However, the actual motivation for this process was just as much about effecting organisational change and acceptance as it was about choosing between products. This process was consensus driven but guided by decision makers who knew exactly what they wanted. From the outset, evidence suggests that there was bias towards the incumbent vendor's product offering. This was explained using words like 'confidence' and 'comfort' in relation to how the organisation felt towards the vendor. Even so, the decision making was rational and was both technically an organisationally justified. In summary, the trust relationship that the organisation had with the incumbent vendor formed the primary decision factor for the system selection. The outcomes from the decision were regarded as positive for the organisation.

Chapter 6

Organisation C

6.1 *Introduction*

The selection and implementation of enterprise resource planning (ERP) systems involves a high degree of organisational change and user involvement. A high number of ERP projects fail or lead to negative organisational consequences (Cooke, Gelman, & Peterson 2001). In this third case, a twenty million dollar ERP implementation at a higher education institution is examined. The implementation was completed; however the goals and original parameters of the project were not met, classifying it as a technical failure. This chapter examines the organisational history that led up to the project implementation. The pre-implementation decision making processes and the information sources used by decision makers are detailed. The case focuses on the justification and factors used in the decision, and the outcomes and relationships with these factors.

6.2 *Overview*

Organisation C is an Australian regionally based higher education institution with enrolments exceeding twenty thousand students. The organisation operates at multiple regional and metropolitan locations throughout mainland Australia and employs in excess of nine hundred full-time employees. In addition, the organisation maintains commercial agreements with off-shore delivery partners to provide courses throughout the Asia-Pacific region. The organisation traditionally focused on domestic higher education contribution scheme (HECS) students who attended regional campuses or were enrolled in distance education mode. However, the organisation underwent a significant expansion in student numbers by targeting full-fee-paying international

students through its commercial operations. This led to significant organisational change, and the need for more effective information systems (IS).

6.2.1 Interviewees

Five interviews were conducted within the organisation regarding the twenty million dollar implementation of an ERP. The interviewees were drawn from across the organisation and were closely involved with the decision making surrounding the adoption of the ERP. The interviewees consisted of a senior executive responsible for IS in the organisation (hereafter the IS Executive), two senior academics operating in an administrative executive capacity (hereafter Academic A and Academic B) and two senior IS professionals (hereafter IS Professional A and IS Professional B).

The IS Executive had over twenty five years involvement with the organisation and in excess of thirty five years associated with the IS industry. He reported to the senior executive of the organisation and directly supervised two sectional managers. The IS Executive stated his expertise as IS management with a background of administrative systems and described his duties as being responsible for providing the organisation with centralised IS support. His primary use of IS was for day-to-day desktop applications with occasional use of the ERP for financial management. He felt that IS was vital to the organisation, stating that ‘The [organisation] cannot exist without good IS systems and we cannot progress without good IS systems’.

Academic A had an eight year association with the organisation with a prior background in engineering. He reported to the Dean of his faculty and did not directly supervise any staff. Academic A stated his expertise was engineering and management and described his duties as being responsible for the educational profile of the faculty. His primary use of IS was for personal productivity using standard office applications: he stated that he

was a ‘technology enthusiast’. Academic A stated that IS was ‘enormously important given what we were trying to do [within the organisation]’.

Academic B had a fourteen year association with the organisation with a prior background in accounting and information systems. He reported directly to the Dean of his faculty and did not directly supervise any staff. Academic B stated that his expertise was systems analysis and project management and described his duties as ensuring that academic standards were maintained for degrees in his faculty. His primary use of IS was for desktop applications. Academic B believed that IS was strategically important, stating that IS was ‘absolutely fundamental in a teaching [environment] … you couldn’t do without it’ and that ‘the place couldn’t function – it would grind to a halt’.

IS Professional A had a sixteen year association with the organisation with over nineteen years in the higher education sector as an IS professional. She reported to the sectional head or the IS executive and supervised a small team of analyst programmers. IS Professional A stated that her expertise was primarily technical but with management aspects and described her duties and maintaining and implementing IS. Her primary use of IS was desktop applications and technical tools such as emulators, helpdesk systems and programming tools. IS Professional A believed that IS was strategically important to the organisations, stating that ‘If we don’t use IS as an organisation … we actually can’t operate effectively It would cost us too much if we didn’t have good IS systems there to operate’.

IS Professional B had a twenty six year history with the organisation and an extensive background in IS. He reported to the IS Executive and supervised a small team of programmers. IS Professional B stated that his expertise was technical analysis and programming and described his duties as overseeing the development and maintenance of the student records system (SRS). His primary use of IS was technical in focus,

stating that ‘I create it’. IS Professional B believed that IS was strategically important to the organisation.

6.2.2 Organisational history

The organisation had traditionally maintained core information systems for financial, human resource and student management. Additional non-core systems included library, business intelligence (BI), email and file sharing services. The organisation had a centralised IS department which had evolved from a small team into a large organisational unit. The IS department handled most of the organisation’s IS needs, as IS Professional B confirmed ‘All major business processes were handled [by IS]’. Before the implementation of the ERP, the core information systems were separate, loosely coupled, and often used transfer interfaces to exchange data.

The student records system had evolved from a primitive suite of COBOL programs purchased from another academic institution in the mid 1970s. It was rebuilt in the early 1980s using a fourth generation programming language (4GL) and continued to undergo a series of modifications in response to organisational and legislative needs. These modifications concluded with a major project in the 1997 to accommodate technical, year 2000 (Y2K) and organisational changes. Outside of major upgrade projects, the system was maintained in-house by a team of three people.

A basic finance system was also purchased with the original student records system. The system required few updates and maintenance was limited. In 1990 a tender process was instigated to replace the system and a commercial product, Finance System A, was selected and implemented. Maintenance and patching requirements were again minimal and the system was maintained by one full-time staff member.

The human resource system was also purchased with the original student records system. Apart from an update in 1990, the system had required little maintenance. In 1993, a tender process was instigated to replace the system and a commercial product, Human Resource System A, was selected and implemented. Only one module, payroll, was ever used in this product and as maintenance and patching requirements were minimal, they were generally satisfied by one half-time staff member.

IS implementations had had mixed success within the organisation. While rollouts of off-the-shelf systems had been generally successful, projects developed in-house had mixed outcomes. IS Professional B attributed failures of internal projects to the ‘overestimation of the programmers’ ability or experience’ and the culture of ‘just in time’ with minimal resources within the IS department. The IS Executive supported this and stated that:

I think the [IS department in the organisation] has been under-funded whenever funding was short. The faculties tended to get additional funds and the divisions were given an allocation and that allocation was never sufficient to cover the requirement.

Commenting on the Y2K and SRS overhaul projects, IS Professional A added:

We got there in the end but we got there just in time. Every milestone only was met just in time. It was there just as the user needed to do that functionality in the system ... The users had this innate faith that we would do it, we would deliver just in time so they wouldn’t miss a deadline ... it was amazing how much faith they had in us and we just got it there.

This ‘faith’ was not universal. There were strong negative perceptions of the IS department within the organisation. Academic A commented that:

There was general dissatisfaction with performance of [the IS department]. That infected some of the discussion that occurred about IS generally … There was, as there is now, frustrations about what [the IS department] was able to deliver, how efficiently it was able to do what it should do, whether it was doing its job properly. There were a bunch of rocks thrown at it from the faculty side.

He went on to add that ‘We had an [IS department] that didn’t deliver … IS wasn’t being well planned and well controlled … We didn’t have adequate systems in place …’. Academic B expressed similar sentiments, having raised concerns with the senior executive in writing. His complaints concerned the silo based approach of the IS department, commenting that ‘I think the analysis work was done in the four walls of [the IS department]. There didn’t appear to be much consultation with the key users…’.

Interviewees acknowledged that much of the negativity surrounding the IS department and its performance was perception based. Many organisational and process based problems were blamed on the IS department and the systems it supported, as Academic A explained:

My feeling about IS at the time was that we were not making full use of it, we were not making full use of the opportunities that IS and IT could offer … We had systems and we had applications and we had IT but it wasn’t implemented coherently. I don’t think we got the full benefit out of it … It was treated as a scapegoat. Part of the issue we had, and still have [is that] a large number of organisational inadequacies were blamed on the software we had to support. [In the case of] student records, there was some truth in that but there wasn’t

complete truth ... We really needed to do BPR ... We had a particular trigger issue which was a problem with late dispatch of distance materials and again, fingers were pointed back to the software but if you dug down into it there were really a lot of issues about how we did things that were not anything to do with the software.

Though critical, many interviewees expressed disappointment in the negative perceptions, acknowledging that the success in keeping the systems maintained had relied on the expertise of the skilled IS professionals within the IS department. This expertise had been undermined a year prior to the start of the ERP adoption process, when one of the sectional heads died. This highly skilled, highly regarded individual had shaped much the IS strategic direction and vision within the organisation. His death created a strategic planning vacuum and had left the IS department particularly vulnerable in a time of change.

6.3 The enterprise resource planning system project

The organisation's IS department had been involved in an Australia-wide project since 1993 to develop a core specification for administrative systems. This specification identified common functional and data requirements in key administrative systems, such as student records. The core Australian specification for the management of administrative computing (CASM) was initiated in 1991 with Australian higher education institutions following one of three different software specification implementation paths. These consortiums were advantageous in terms of software purchasing power and knowledge leverage.

The organisation was aware as early as 1989 that it needed to replace its student records systems (SRS), so had joined the CASMAC and the implementation consortium with a view to adopting the completed product. There were considerable pressures on the

legacy student records systems and it simply was not designed to meet the operation needs of a modern academic institution. The system was suffering from the constant changes required, for example, the introduction of HECS fees. As IS Professional A noted:

Every time DEETYA ... changed things it was a real struggle for the system to cope with it ... It was band-aids on top of band-aids keeping it together. If we didn't have the staff in IT, it just would have died.

However, the CASMAC initiative was abandoned by the organisation in 1997. IS Professional B noted that 'eventually the project went off the tracks' and failed. This left the organisation in a precarious position, as IS professional A explained, '[The CASMC initiative] was going to be our saviour and we were left with nothing.... we were left high and dry'. Although immediate work began on the SRS Y2K overhaul, this was regarded as an interim solution. As IS Professional A noted:

[The SRS] was on its last legs literally ...It couldn't keep up with the changing requirements of government easily ... It couldn't keep up with the requirements of student admin or the faculties ... the backlog of work was huge. The [organisation] needed to go more for [a] self-service model ... and they just couldn't do that.

The IS Executive gave further examples of problems with the system:

We couldn't get the information that people considered to be reliable. The system had been patched and changed so many times and people could get information about class lists ... from a number of paths. So if you went down one path you'd get one set of answers and if you went down another path you

get another set of answers. Because they weren't time-stamped on the way, people were getting a view of data at different times and there was nothing on the reports that would say what the time-stamp was and so the data was inconsistent. So the end user, not knowing any of that sort of intricacy, would see inconsistent reports and they'd be working on one lot and the other side was giving a different answer. So when you got to graduation, nobody could really tell who was going to graduate because one lot of people were saying these people are graduating had one list developed at one period of time, and the faculties were having another list so that we had a number of people giving up on the centralised system and writing their own systems and keeping track of it that way.

These views were also supported by Academic B:

There was functionality missing, there were bugs. You could run a program one time and get one answer; you could run the same program five minutes later without any updating and get a different answer ... Graduation ceremonies became a nightmare as you could never identify who your graduands were ... The system wasn't handling four terms properly.

The issue became critical when, as Academic A stated, 'In [19]97 we had a bit of a disaster with the late dispatch of study materials'. This resulted in an investigation that highlighted problems with business processes in the organisation, as Academic A explained:

The finger got pointed at the system but when you picked it apart there were a whole bunch of issues in the way that enrolments were recorded, in the way enrolments were updated and the way that programs [and] applications were put

into the system, the way that information was passed around the place and the root of it seemed to be us at that time, the associate deans, that there was a lot of paper stuff happening, it wasn't happening in a timely fashion, things were getting lost and the net result was that we really didn't know where we were and we needed to fix that. But, it was recognised by us or certainly me that a lot of this was business process ... We had this review session where we had "no blame" type things where we walked through what had gone wrong and I guess we recognised that the student system was a factor in this and that business process re-engineering was desirable. So I ended up, and so did [Academic B], ... on a review committee for the student information system that [IS Professional A] was also on ... and that really tried to flog through what we really had to do about the student system. My memory at the same time was that [The IS Executive] was looking at [ERP A] as an option ... and he had a download disk of [ERP A] which he let me have and I remember thinking "yeah that looks fairly good".

The issue of replacing the SRS was raised at a meeting of senior executives in the organisation and a working party was formed. There was strong support from the Senior VP for integration of the organisation's administrative systems and the re-engineering and development of better administrative procedures and practices. It was at this point, a critical decision was made to replace the SRS. The IS Executive explained:

They wanted a student system and they wanted a finance system that was easy to integrate with the student system and while we're at it, we also need a HR system ... The top priority was still the student system.

However, there was little organisational experience with large corporate systems or the implications of selecting and implementing them. The IS Executive explained that

‘Nobody outside [of the IS department] had heard of [an] ERP’. Even so, many in the organisation believed that purchasing an off-the-shelf system would be financially a better option. According to Academics A and B, the IS Executive was strongly opposed to building a new system in-house. Academic A stated that:

[The IS Executive] certainly presented the view forcefully that we shouldn’t be building systems in-house, we should be buying them off the shelf because that was going to be a lot cheaper. My memory of the sorts of figures that were being talked about at this point in time were maybe a million bucks, maybe not even that much ...

I think what we had in our heads was that there were about three people in [the IS department] working on a student records system and maybe the calculations went like this: We’ve got three people over there working on this, that’s one-hundred and fifty grand a year. We can buy one more cheaply because that’s what we’ve been told therefore we would be spending about one hundred thousand dollars to get a new student records system. That may have been what was in my head and that goes back to my ignorance of information systems [then]. ... If I talk to [the IS executive] now, he says that the information about the likely expense was passed around and that people should have known. That wasn’t in my head at the time. Certainly what was in my head ... was that this was going to be a fairly low-cost activity.

Few in the organisation imagined that the ERP implementation project would have a projected budget of fourteen and a half million dollars. Academic A confirmed this with the comment that ‘All I can say is that I think what was in my head was that we were talking about hundreds of thousands of dollars to fix our problem, not millions of dollars’. Academic B had a similar recollection:

I felt that at that meeting it was almost cut-and-dry that it wouldn't be the idea of upgrading "in-house" ... I think [upgrading] the existing system wasn't considered ... We haven't got enough staff to do it so we'll go and buy a package ... There was a strong feeling within the group that [a] package was the only way to go ... In hindsight, some of them would have second thoughts because I think they thought it was just like buying "Word" and it works and this was a very different kettle of fish. I think that very few of those who made the decision had had exposure to the idea of buying a package before, let alone an ERP.

This apparent resistance to an in-house major development project also existed within IS department. This was explained by IS Professional A:

Our philosophy was that we need to go and get something off the shelf because everybody needs the same things in a student system and we as an organisation would find it difficult to keep up with ... the government regulations.

When asked where the philosophy had come from, she replied:

I think that was what was predominately in the literature at the time ... [The IS Executive] had that view, [The deceased IS sectional head] had that view. We had had pretty good success with the finance and [HR] systems and the users were happy with the functionality that we got from those systems ... Everyone was quite happy to go out and look for a product and evaluate what was out in the marketplace.

IS Professional B also noted the IS Executive's preference at the time, stating that:

[He] had a feeling that we'd be better of going with a commercially written product so that we weren't so subject to legislative change, internal change ... and we'd only need a few people to maintain the programs. He was also keen on introducing workflow concepts.

In late 1998, the organisation issued a request for proposal (RFP) for the delivery of an administrative information system. Three vendors responded and performed software demonstrations onsite. An evaluation committee was formed to perform a high-level functional analysis of the alternatives. In March 1999, the organisation approved the purchase of the ERP A finance, payroll and student systems costing approximately one and a half million dollars. The organisation then commissioned a detailed five week consultancy with the implementation partner, Consulting A, to prepare an implementation planning study (IPS). The purpose of this study was to identify project priorities, develop the business case in respect to benefits and costs and to scope deliverables. As a result of this study, an implementation budget of approximately fourteen and a half million dollars was established.

The ERP implementation project was subject to budget and time slippages. The final cost to the organisation was estimated at twenty million dollars. Functionally, the implementation project only delivered the student and half of the finance systems. Extensive work after the implementation costing in excess of three million dollars was required to address functional issues and implement remaining modules.

6.3.1 Decision making process

The ERP pre-implementation decision making process occurred over a six month period at multiple levels within the organisation. The process involved the selection decision and the series of decisions concerning implementation. The process was initiated by a

senior executive committee tasked with formulating a strategy to replace the legacy student records system.

At the beginning of the selection process, the IS Executive informed the committee of senior executives that there were three vendor alternatives. These vendors were asked to respond to the RFP. However, at the time there were at least four vendors with student modules, at least two of these with mature student records systems. One of these vendors was not invited to tender, and IS Professional A stated that they did not submit a response to the RFP. This indicates that a level of pre-selection was occurring in the early stages of the process.

On receiving three responses to the RFP, vendors were invited to the organisation to demonstrate their products. At the same time, an evaluation committee was formed from members of the faculties and divisions, including student administration, finance and IS. Academic B chaired this evaluation committee which also included IS Professionals A and B. The evaluations relied on vendor demonstrations and a form of high-level functional analysis. The analysis, although documented, was a cursory examination of functionality completed by individuals. Particular emphasis was placed on examining student functionality, as Academic B explained:

I formed the opinion that we were looking at a fairly substantive package and whilst they were ERPs, there was no doubt from the meetings I have mentioned earlier that, although it would be likely to have an ERP, the emphasis was to be on students.

There was confusion and frustration amongst members of the evaluation committee as to what their roles on the evaluation committee were and what was expected of them. Many believed it was a basic advisory body with limited terms of reference. IS

Professional B believed that the review completed by the evaluation committee was cursory, stating that:

As far as I was concerned the advisory committee was only advising on what they thought was the best solution ... they didn't look into it in terms of suitability in detail.

He went on to add that 'we didn't actually talk to anybody who was using the product on the sites or anything like ... it was really the glossy brochure without even the test drive'. Academic B admitted that the evaluation was not necessarily as rigorous as it could have been by stating that 'You could argue ... that we did not follow the government requirements'.

On completion of the demonstrations, the evaluations were combined into a report which was presented to the executive committee. ERP A was nominated as the preferred of the three products. The executive committee made recommendations to the Senior VP in the organisation to proceed with the purchase of ERP A. Academic B described the following steps in the decision making process:

It went from [the executive committee] back up to the [Senior VP] who by that stage had formed another committee to keep looking at it. We knew that [Higher Education Organisation A] was the first cab off the rank so we actually had an ISL (video link-up) with a number of key people at [Higher Education Organisation A] and we actually formally recorded that We also had some staff actually visit [Higher Education Organisation A] to confirm what they thought of [ERP A] and how things were going. It was no secret that at that stage that they were starting to blow their budget and we were getting a bit

concerned and that's why the [Senior VP] wanted to keep a tight rein on the finance as it emerged.

As the purchase of the ERP was above the expenditure the Senior VP could approve, there was a special presentation to Council. Council saw part of the [Higher Education Organisation A] video plus presentations from various members of the evaluation committee. They were also provided with an executive summary of the evaluation committee report. Council then confirmed the decision to purchase ERP A.

Although the selection decision was the expected one, aspects of it disturbed parts of the organisation. Academic A described his reaction to the purchase decision as partially one of disbelief at the cost. He also noted that an 'integrated' requirement had crept into what was originally a decision to replace the student records system. This requirement meant that a finance and human resources system had become part of the selection decision. He stated that:

The software decision was announced Another thing I remember hearing at the time was that the integrated aspect of it must have been raised somewhere – maybe that came from [IS Executive] at one of the [senior executive] meetings because we were focused on the fact we needed a new student system ... I guess we didn't necessarily like the [existing] finance system too much, but it wasn't irretrievably broken ... and what came out of the selection process was this thing that we got a special deal from [Vendor A] and we could have HR and Finance thrown in for not much money and that it was only going to cost us one and a half million dollars... and I remember hearing that figure and going "holy shit ... one and a half million dollars, that's a lot of money".

After the purchase decision, a series of pre-implementation decisions were made. These resulted from an implementation planning study with the ERP implementation partner. The organisation was locked into using a specific implementation partner because, as Academic B noted, '[Vendor A] were only interested if they could use Consulting A [as the implementation partner]'. The purpose of the implementation planning study was to perform gap analysis between the needs of the organisation and the functionality of the ERP, plan the implementation strategy and estimate resource requirements.

During the implementation planning study, indications from other organisations were that ERP A was missing functionality and that the implementation would be more costly and difficult than predicted. IS Professional B explained:

There was a gap of about six months from when we were told that we'd be going with [ERP A] until when we actually signed the contract and to do the implementation and I was involved in that scoping, planning study. During that planning it was fairly obvious that the product wasn't how it was presented in the presentation ... it wasn't nicely integrated ... we were getting feedback that one, it wasn't integrated, two, it was much more embryonic that we were led to believe ... no [organisation] in the world had implemented the whole student solution and there were quite a few instances of cost over-runs trying to implement it.

Concerns were also raised about how effective the implementation planning partner was in scoping the project requirements. IS Professional A stated that: 'we were aware that there were concerns by other [organisations] that using [Consulting A] as implementation partners [and that it] may not have been in our best interests'. He expressed concern that feedback was generally avoided by the implementation partner during the implementation study and that thorough scoping had not been performed. He

concluded that 'From the way the implementation planning was done, I didn't have confidence in either the implementation partner or the [implementation] approach we were taking'. Even so, of all the documentation examined from this organisation that was relevant to the decision making, the IPS report was the most comprehensive and formal.

On completion of the implementation planning study, the plan was submitted to Council and the organisation approved the implementation of ERP A with a budget of fourteen and a half million dollars. This implementation budget concerned many in the organisation, as Academic A explained:

Later, when the presentation went to Council it turned out that it was going to be fifteen million bucks or fourteen and a half million dollars and ... everybody just freaked out. And certainly whilst I now understand that that should have been a reasonable expectation, at the time it seemed like it had gone from something that was going to be a couple of hundred grand to fix to something that was an enormous monetary project.

The selection and pre-implementation decisions were categorised by interviewees as formal, although there is considerable evidence from their comments and organisational documentation to suggest otherwise. Much of the decision making was not documented and a business case for the project was not prepared. The most comprehensive documentation occurred after the selection decision as a result of the implementation planning study. IS Professional B stated that 'The implementation planning study was [the] most formal thing we had ever, ever done before'. Notably, the gap analysis was performed at this point in the project.

Interviewees made criticisms of the informality of parts of the process. Academic A noted:

There was a formal process around buying the software. What I think we lacked, and still lack adequate formality around is, is making IS decisions. ... This was a major business investment decision and I don't think it was adequately explored by the management of the [organisation].

Academic B concurred, stating that:

Well it had some structure to it ... the fact that it had these committees established ... in hindsight I think we could have properly defined what was required and ... tighter terms of reference ... and I don't think we did enough investigative work ... For example, even though I was chair [of the evaluation committee], I never went anywhere other than my office to do the investigation.

The lack of formality and transparency in the process led to external criticism in the annual audit report. Academic A explained:

We got negative audit comments for whatever it was that we did in that process. Part of our qualification for 1999 was that we hadn't done an adequate job around [ERP A] procurement and I think the negative comment was to do with the fact that the [organisation] didn't know what it was getting itself into and I have to say, my feeling is that that comment is fair. Now [the IS Executive] has a different feeling on this because [he] believes that people should have known, there should have been no surprises about the eventual price tag that came with this thing – but that wasn't my understanding at the time.

The IS Executive admitted the procedural error, stating that:

We made an error, I guess in the process, in that the initial decision was to buy the [ERP A] software which was [one million, four hundred thousand dollars] and Council signed off on that [one million, four hundred thousand dollars]. The auditors of the Auditor-General's Office later criticised us because we should have at that early stage, advised Council of the total estimated cost.

As noted earlier, the total cost of implementing the ERP became apparent only after the implementation planning study. The IS Executive added:

But the Auditor-General said that we should have made an estimate of what the total cost would be at the time we decided to buy the software because their argument was that if we spent [one million, four hundred thousand dollars] that would lead to more expenditure and we should have made some estimate of what that expenditure was even though we tried to explain we didn't know until we did the scope (sic).

Interviewees acknowledged that the organisation could have improved the decision making process in a number of ways. The curious decision to purchase the ERP before completing a thorough gap analysis and scoping study was one area that the IS Executive singled out for improvement. He stated that:

We probably, in hindsight and given the rules of the Auditor-General's Office, we should have got authority to spend money on a scoping study before we committed to buy the software. But we committed to the software prior to the scoping study – we should have said “let's spend half a million dollars and seeing how much it is going to cost to put in [ERP A]” and potentially and at the

end of that say “no, we won’t proceed down that path” but the auditor would have said “you’ve only lost half a million dollars”.

Academic A believed the organisation did not explore decision options adequately but this was symptomatic of poor decision making practices in the organisation and the wider sector. He stated that ‘I think the [organisation] has had a problem with strategic and operational planning’. He felt that that the evolving, unclear decision making procedures and practices that existed in the organisation had led to decisions that lacked obvious precursors and justifications. IS Professional B supported this and admitted that he did not see the need for an ERP and felt that the decision to push ahead and acquire one had come from the IS Executive. He believed the process was at a ‘very high level’ and lacked detailed consideration.

One final concern raised about the decision making process was the reliance on the implementation partner to guide the pre-implementation decisions. Interviewees believed that the implementation partner was not truly independent and was too closely connected with the vendor of ERP A. They believed that the organisation needed greater in-house expertise or independent external consultants involved in the process, as IS Professional A explained:

[The process could have been improved] if more of our staff aware of the theory and process behind what [Consulting A] was doing. We just blindly took their lead. We did what they wanted us to do to get the results to implement the [ERP A] software … maybe from a more impartial standpoint, maybe we should have had someone involved … with the background … employed our own independent consultants who worked for us because none of our existing staff had that experience or knowledge about how you go about putting in a system … [Consulting A] looked more like a implementation partner of [ERP A] rather

than our partner ... so we really should have had our own project management or those sort of consultants that were more our employees rather than [ERP A's].

Interviewees presented varied opinions on how strongly personal opinions affected the decision making process. The IS Executive felt that he had had a heavy impact on the selection process, stating that 'At that stage I was one of the driving forces to go [ERP A]'. This is consistent with Academic A's statement that the IS Executive had handed him a disk with a demonstration of ERP A even before the RFP was called.

There was another indication of this pre-decisional bias with IS Professional B's belief that he had little impact on the decision. He commented that 'I think [the IS executive] was pretty keen to go with [ERP A] before we started the whole exercise'. When asked how this was indicated, IS Professional B responded that 'He was mentioning it a lot and that we need to go with ERPs because they are state-of-the-art and we need to introduce workflow procedures'.

IS Professional A also felt she had little impact on the process. She believed that the decision had been made very early in the process and that everything that came after it was justification:

They had a team of more senior people that made the decisions ... you got the impression that they already had the decision they wanted ... and what we were doing was to justify that decision ... I thought [ERP A] was an okay product [anyway].

Academic A also believed he had impacted as a lobbying force, stating that his opinions were:

Not insignificant but I think the tide was turning, if I hadn't of been there I don't think the [organisation] would have made a different decision ... I did try to take an advocacy role at that time about how the [organisation] ought to fix up its problems but I wouldn't be arrogant enough to suggest that if I hadn't of been there it wouldn't have done the same thing because I think it probably would ... maybe not as quickly.

This lobbying force was also noted by Academic B. He felt that he had a strong influence on the decisions, stating that 'I know some Council members who said "if you recommend [ERP A] we'll go with it"'.

From the data available, it appears that the processes used to make the selection and pre-implementation decisions were informal and in some cases, procedurally flawed. There are also indications that the processes were subject to bias and lobbying. Process ownership was poor and many of the key decisions were taken after a commitment had been made to implement ERP A.

6.3.2 Information sources

The primary source of information informing the ERP selection decision came from vendors. Much of the information used by the evaluation team was gleaned from the demonstrations, as Academic B noted:

One problem was that there was very little documentation available on any of the systems. So, what they did was arrange a demonstration on campus where anyone could attend ... this was done by the three [vendors].

The IS Executive noted that the evaluation was based primarily on the information about the student records system received from the vendor:

Our reason was that everybody has a finance system – you can get a finance system from anywhere. Everybody has a HR system, you can pick up one of them. Student systems are very big, complex systems and so our decision was mainly based on who had the best student system. That's where our major concentration was ... mainly directly from the suppliers.

This was confirmed by other interviewees, who also nominated internal organisational knowledge and personal experience as other information sources. From the process used to confirm the selection decision, it is also clear that external information sources were used. These included technical and management staff at other organisations and consultants. Consultants were the primary information source for many of the planning and pre-implementation decisions.

6.3.3 Decision justifications

Limited formal documentation was produced to justify the ERP selection decision. Justifications were primarily stated through minutes of meetings and emails. As noted previously, a formal business case stating tangible and intangible justifications was never developed. The primary justification provided was an urgent need to replace the ailing student records system, as Academic A explained:

I don't recall that there was ... an explicit business case developed... we didn't have adequate formal processes at the time ... At the time it was envisaged as a "do or die thing". We're screwed, we have a system that really doesn't support us ... we have no option but to fix it and the fuzzy notion we had of costs wasn't fourteen and a half million bucks.

Academic B supported this, stating that ‘Everyone in Council knew the current system was no good … it had problems … it needed enhancing … it was antiquated in parts and everybody realised something had to give’.

A number of other justifications were documented in emails from senior executives to the organisation. Many of these centred on the need for business process re-engineering (BPR) within the organisation and the belief that an ERP would solve many systems problems. As Academic A noted, ‘The justification was that we didn’t just have a technical problem but a business process problem’. The ERP was seen to address this issue by providing ‘best practice’, integration and work-flow.

Technically, similar look and feel, common hardware architecture and the ability for programmers to work on all major systems with one common toolset were nominated as justifications. IS Professional A also noted that the justification for an off-the-shelf product was vendor support. She explained that this meant that the vendor, not the organisation, had to implement modifications to the software whenever legislative changes occurred:

We needed a product so that we could keep up with the changing government demands so that we didn’t have to keep reinventing the wheel … the vendor would then take on responsibility for legislative changes.

Cost savings were frequently cited as a key justification for the ERP implementation. It was estimated that three hundred casual, seasonal and temporary staff positions would be saved by implementing the ERP. This was quantified by the finance manager as a saving of approximately three million dollars per annum. However, few in the organisation believed the cost savings would be achieved, especially those with

operational IS experience. IS Professional B was particularly scathing about the cost saving justification, stating that ‘The decision to implement the ERP was based on cost savings which were invented ... I know the savings were absolutely fudged’.

There were two justifications cited for acquiring an ERP that did not appear in any communication or documentation of the time, but were discussed by interviewees. The first concerned the decision to buy rather than build. The IS Executive estimated that it would have cost approximately six million dollars to build a new student records system using in-house resources supplemented by contractors. However, the lack of organisational confidence in the IS department’s ability to do this was his justification for purchasing an ERP externally:

One of the reasons we decided ... were of the opinion in [the IS department] that we could have written a student system ourselves. But, we were not convinced ... we estimated we could build the system for about five or six million dollars over a number of years, a couple of years, we were not convinced that the [organisation] would continue to fund us because we thought that we’d get halfway through the process, at the end of the first year say, have spent two million dollars and have absolutely nothing to show anybody that we’ve spent two million dollars on systems development. I think their view would have been “Aw, let’s go and buy something because we’ve just thrown all this money at this internal organisation, they don’t know what they’re doing, they haven’t produced anything, we’ll go outside”. I guess we saw a lack of confidence from senior executive in our ability to do it.

The second justification concerned the choice of vendor. Vendor A had a significant presence in Australian higher education institutions at the time of the selection decision. However, there was also perceived risk by members of the IS department, who were

concerned about a small institution going with one of the smaller ERP vendors. IS Professional A explained:

The other element was to do with the size of our organisation ... We are too little to make a decision selecting a software vendor that no one else has picked.

Part of the reason to buy [ERP A] was that it was a financially viable organisation, it had an existing customer base in America and Australia with [a] Student [records module]. Part of the reason not to pick, say [ERP B], was that it didn't have a big customer base, there wasn't enough of the software there to say "yes, it will achieve what we want in the end by the time we need to go live" but [Vendor A] already had a bigger customer base in Australia, other [organisations] were picking [ERP A], we were too little to go and be out there on our own... we had to go with what the other major [higher education organisations] were doing because that ... added to the decision making process but it also adds to the clout when we need changes to the software ... we've got a bigger user group ... We couldn't gamble on going on a smaller provider.

It is notable that the justifications were poorly documented and that different elements of the organisation had differing prioritisations of justifications provided for selecting the ERP. Senior executives were focused on cost savings and re-engineering business processes. Users of the system were focussed on having a product that functioned and would service their basic needs. Members of the IS department were concerned with technical issues, vendor support and vendor presence. Many of these justifications were disconnected and unrelated to the abilities of the specific product selected.

6.3.4 Decision factors

Many influences and informational factors affected decision making during the selection and pre-implementation phases. The contextual environment was complex and strongly

affected the decision making. This environment consisted of a mix of organisational pressure, organisational culture, politics and a lack of experience.

The political and organisational pressure to quickly replace the student records system was driven from the faculties. There was a consistent theme that ‘something had to be done’. Academic A explained that ‘The politics of a [higher education institution] is that the faculties are where the political power is ... so it was undoubtedly influenced by the desire of the faculties to see things fixed’.

Academic A believed the lack of a business focus or cost culture in the organisation had a significant impact on how the organisation went about making major strategic decisions such as the ERP adoption. Academic A stated that:

A major cultural factor is, was, and is (sic) that we didn’t and don’t have a cost culture or a cost-analysis culture and therefore it was okay to make significant operational business decisions without having done a business case.

He also pointed out that the people making the decision were not people with the understanding to do so, remarking that ‘A cultural issue was that people who were heavily involved in the decision making didn’t know what they were bloody talking about’.

An element of the political environment was the lack of organisational confidence in the IS department. This excluded the internal build option and there are indications that this organisational belief may have been used by individuals to shape the process and outcomes. The IS Executive stated that ‘Part of the internal politics was getting a system that was written outside the [organisation] by a package solution rather than developing it’. These comments were supported by Academic B, who as chair of the

evaluation committee, felt that his options were restricted. He stated that 'I felt my hands were tied behind my back for a start, when I don't think I had the choice of looking at the fourth option'. The 'fourth option' he referred to was that of building a new student records system in-house. Academic B stated that this was a major influence on the decision making process. He explained that it was made clear that the system was to be purchased and that the possibility of building in-house was 'not to be considered'.

From this and statements from other interviewees, it appears that the IS Executive was chiefly responsible for pursuing this agenda. There are also indications that he exhibited pre-decisional bias towards ERP A and made the comment that 'We ... I guess through the whole process we tended more towards the [ERP A] solution'. IS Professional B maintained that the pre-decisional bias was very strong. He believed that because of it, the decision making process was illogical and based on little substance. He remarked that 'There must have been something operating on the decision process. I was a bit amazed that we went from the ... glossy brochure to putting in an order basically'. He believed that 'decision to go with [ERP A] was made outside the group [of senior executives]'. His belief was that the IS Executive had decided long before the evaluation process that ERP A would be selected and implemented.

Although the contextual influences were considerable, interviewees discussed numerous tangible informational factors that affected the decision. These centred on functionality, product maturity, customisability and the user interface. The IS Executive explained:

We looked for [an ERP] that would handle the size of the [organisation] we were, given our range of offerings and our complexity. So it had to be scoped in such a way that it would meet our requirements.

Most of this information was gleaned from the vendor presentations and sales literature.

The presentations clearly played a significant role in the decision making. IS Professional B stated that ‘For me, … at the end of the presentations, we more or less agreed that [ERP A] was the most likely one worth looking at’. He went on to add that ‘[ERP B] was quite good but very developmental and that was the main reason that it was scrapped’. Academic B stated that:

My memory of the presentations was that [ERP A] looked good, [ERP C] was vapourware and so was [ERP B] … It looked to me from attending the presentations it was hands-down that [Vendor A] were really the only people who could deliver and … I think the selection panel drew the same conclusion.

IS Professional A remembers the following from the presentations:

[ERP C] wasn’t that impressive but its finance module [from Vendor D] was very impressive … workflow, features et cetera … [However it was] all very much vapourware. [ERP B] had a good intuitive front end. [However] you got the feeling that when they were demonstrating it … when we were asking questions about can it do XYZ and how does it do this function, they were asking as how we would like it to perform this function and taking notes on it and basically saying yes, it will do it that way … Certain functions hadn’t been developed that were important to us.

Customisability formed a key factor as the organisation approached the ERP adoption decision with a belief that they would customise the product to meet the organisation’s needs. This belief is noteworthy as it demonstrates a poor understanding of ERP adoption best practice and shows a lack of organisational experience and awareness.

Even so, IS Professional A commented that ERP A's 'key appeal was that it was customisable'. She went on to add:

The fact that you could customise the product made the decision makers, like the steering committee ... very comfortable ... they said "well if it can't do what we want because we want to do it slightly different then we change the product to do it that way" so that gave them a sense of comfort ... the other two systems didn't have that functionality.

Best practice in ERP adoption is to minimise customisation and instead change organisational practices. Should the organisation be unwilling or unable to change, then the ERP adoption decision should be reconsidered.

The user interface was another functional factor that affected the selection decision. The IS Executive commented that 'we were looking for something that had a web-based interface and if not, one that was currently available [with a web interface] on a stated forward plan'. This was seen as important as the legacy student records system had web-based interfaces. This factor is curious as the product was not actually scoped in a feature match until after it was purchased. At the time of the decision, decision makers would not have been aware that ERP A did not deliver the web interfaces they required.

Although cost and cost savings appear as central justifications for the ERP adoption decision, they were not regarded as central factors. The IS Executive explained:

I guess to be fair, whilst we were looking at budget, we didn't see the cost as a primary decision maker ... We didn't necessarily look for the cheapest solution, we looked for one that would best suit our needs'.

When asked if there was an emphasis on how the product could save the organisation money, he replied ‘No. Not in any formal sense. It was seen as we had to have a new system. We had been in reality looking for a new student system for the past ten years’.

Of all of the tangible factors, those concerning vendor presence within Australia appeared to have carried the most weight. The reason for this was that there was so little information about the products and how they would fit with the organisation that there was a belief that the organisation needed to use the predominant vendor. Academic A summed up the situation by stating that ‘Thirty-five [organisations] in Australia, twelve of them put in [ERP A] about the same time’. Academic B discussed the same consideration:

We also looked at who within Australian [higher education institutions] has what packages and who is proposing to move to what packages. It was clear that [Vendor A] had the vast majority of the sites, for example they had [numerous institutions].

In a related factor, vendor size was also seen as important. IS Professional A explained:

The fact that [ERP C] was set up as a small company from [another organisation], with the [organisation] ... there was a sense of nervousness about it ... will it still be here in five years time? And [ERP A] system being a global company with so many [organisations] in the States and a lot of other private organisations who use their finance and HR system ... just the sheer volume of the organisation in money terms gave us a better sense of security with that product ... they’re going to be here in ten years time basically rather than “oh, we’re going to be left on our own” so that was very important in the decision making’.

The vendor size was also seen to be related to the level of vendor support that could be expected, as Academic explained:

I thought that [the IS department] wanted [ERP A] mainly because it was a multi-national firm where as [ERP C] was just another [organisation] and wouldn't have the level of support and [ERP B] had only one [organisation] and was just kicking off in Australia.

A key factor with tangible and intangible characteristics was the views of other institutions using ERP A. These views affected the decision making process of the senior executives in the organisation. Academic B explained that 'They were shown the [Higher Education Organisation A] video and they were told that most [similar organisations] in Australia were going to use [ERP A]'. The IS Executive explained how this affected the senior executives:

We then got the senior executive and some Council members. We had them in a video conference link to [Higher Education Organisation A] who had chosen [ERP A]. [ERP A] and the [Vendor C/D] solution both had consultants attached to their submissions. [ERP A] came with [Consulting A] and the [Vendor C/D solution] with a consultant as well because it was the consultant that got the software together. We chose [Higher Education Organisation A] ... and we had the senior sponsor of the [Higher Education Organisation A] project, maybe the Vice-Chancellor of [Higher Education Organisation A] on the video conference link assuring the senior executives at this [organisation] that it was the right decision to make and why they'd made their decision, so, the [Senior Organisational Executive], then signed off.

This factor is notable for a number of reasons. Once again, it demonstrates the lack of organisational faith in the internal IS department and its ability to make sound recommendations. Secondly, it highlights the different information sources used by different strata of the organisation. It is important to note that while the senior executives were receiving reassurances, the IS professionals were receiving warnings about problems with ERP A from technical staff at other institutions.

Existing vendor relationships were considered during the selection process. The organisation had an existing relationship with Vendor B, who supported Finance A. The relationship was strong and a high level of trust had been established because of the high quality of the vendor's product. The organisation did not have relationships with any of the other vendors.

One final intangible factor concerning internal confidence played a role in the selection decision. Confidence internally within the IS department was low given the organisational perceptions and pressures. Members of the division realised that the project needed to succeed or they would be blamed once again for perceived technology failure. The lack of internal expertise, particularly in project management, placed the IS department in a vulnerable position. Thus the packaging of Consulting A as an implementation partner with ERP A was attractive at a number of levels. IS Professional A explained:

The fact they had an implementation partner was a big factor as well. To implement an ERP an organisation can't do it on its own and I think [Higher Education Organisation B] is proof of that because they didn't have an implementation partner. To have someone who will see you through all the political quagmire that we had to go through to get decisions made ... to keep us focused and on path ... I think that was another reason.

The reference to Higher Education Organisation B relates to an organisation whose implementation of ERP A was a public failure at significant cost to the institution.

Many of the factors discussed acted in concert. Although interviewees believed ERP A was the more mature product based on the vendor demonstration, it is clear that there were also significant political and organisational pressures shaping the outcomes. There are indications that some of the factors used to make the decision were unreliable and that communication between decision makers at different levels of the organisation was poor. Common themes are a lack of trust and confidence and a misalignment of goals between elements of the organisation and individuals.

6.3.5 Decision outcomes

The perceptions surrounding decision outcomes in the organisation were mixed. However, the undisputed facts are that the project was completed over time, over budget and without all the anticipated functionality. Many of the initial pre-implementation decisions can be attributed to negative outcomes. The IS Executive gave one example of how a change in the implementation priorities of modules negatively impacted on the implementation of ERP A:

We always wanted a student system as top priority. When the federal government introduced the GST, the then Director of Finance convinced the [Senior VP] ... this is halfway, three-quarters through the scoping study ... that we needed to change direction and put in the finance system first. The reality is that we could have kept the finance system we had; we could still be running it now. We could have got away with just putting in the student system and concentrating our resources on that and I think that would have been a better outcome. Because we then had a combination of problems with finance

directors and having to get the finance system working for a tax change, [it] increased pressure on getting that done and spending lots of resources on doing that was probably unnecessary in reality ... it could have been put into doing more things for the student system so that we could have had better acceptance and we could have delayed the finance implementation.

Another controversial pre-implementation decision concerned the average fifty-five hour working week. This decision was strongly promoted by the implementation partner, Consulting A, and was used to reduce the costs of the implementation project. While it is not uncommon to work longer than average hours in IS projects, this is usually for short periods of time and would rarely exceed six months. In this instance, the project was over two years in duration. IS Professional A remarked that 'In hindsight, I think it was wrong to work for such a long period at those long hours' and that it 'was a bad decision'. Many of the project team members were mentally and physically fatigued and this negatively impacted the ability to meet deadlines.

Some interviewees, such as Academic A, did support the pre-implementation decisions. However he believed that the organisation's perceptions about the processes used to reach decisions caused later negative outcomes. He stated that:

I don't think the decisions were the problem. The way the decisions were made, I think, had significant negative outcomes for the IS project because the perception that we stumbled into it and that we committed to it without necessarily understanding what the implications were, I think caused us some real problems down the track in terms of sponsorship and therefore support and therefore because of that, the success of the project ... the way the decisions were made had a major negative impact on how successful the project was.

The decisions had longer term impacts on the organisation. IS Professional A felt the decision to adopt ERP A had affected the way the organisation approached its rollout and implementation decisions. She stated that ‘We are much, much more vigorous in how we put things from a development environment to a production environment. That’s been a big cultural change in the area I work in’. Academic A agreed, believing that the way in which decisions were approached in the organisation were changed and that it had substantially altered the landscape of what could and could not be done in the organisation. He believed that the outcomes from adopting ERP A had strengthened internal process compliance and the ability to access information but at a cost to the organisation. IS Professional A also believed the system provided more stringent financial controls and enabled timely student enrolments.

However, all interviewees acknowledged the significant negative organisational outcomes. Academic A stated that ‘A lot of good has come out of it … but, we’ve done a lot damage to ourselves in the process, a lot of emotional damage to the organisation’. Academic B had similar views, stating that it had been a ‘financially bad’ decision for the organisation. IS Professional A concurred and noted that the level of customisations was a high ongoing cost to the organisation:

In hindsight it was a bad thing to put as many customisations as we have because as an organisation we can’t afford to keep them there … it costs a lot every upgrade just to reapply them.

The adoption of the ERP led to a perpetual enhancement and maintenance cycle. Higher numbers of IS staff were required to maintain the system. A team of three analyst programmers had grown to over fifteen programmers, functional analysts, database administrators and systems administrators. IS Professional A stated that ‘We need a lot more people to look after it than we ever had before. One programmer cannot cope and

look after the [ERP A] system'. This was a notable comment given a key justification for the ERP adoption was the reduction in staff.

Perhaps the most negative outcome was that the organisation had not realised the benefits from using ERP technology. Business processes had not been reformed nor had workflow been implemented. Much of the ERP was simply not used. The IS Executive explained:

We haven't fully realised the benefits of an ERP yet. Essentially what we've got are two components of an ERP system that have a similar look and feel but the fact that they are part of an ERP... I don't think the [organisation] is really using it as an ERP. They could have been separate best-of-breed systems if you like ... the way we're using them. There is some close integration of the finance and the student finance part but I don't think we've realised the benefits yet of an ERP ... There is potential for us to reap some benefits out of having an ERP when we move to the next phase ... putting in the next version of finance, student and implementing HR.

Few interviewees believed they would have approached the decision making in the same way again. Some doubted they would have reached the same outcome given their experiences. Although the IS Executive firmly believed in the selection decision, he regretted some of the pre-implementation decisions. One of these decisions was the implementation schedule, and he stated that:

Hopefully I would have resisted the change from the order in which we put things. I think we stuffed up the implementation with the finance system taking priority over everything.

Academic A also agreed with the decisions, but indicated that he felt that the perceived failings of the decision making processes were the cause of most problems:

I think we did the right thing. People say that we shouldn't have had [ERP A] ... if you went through that selection process you would have had to been mad to buy those other products ... there are plenty of things wrong with [ERP A] as a product but they are not our problems ... we can work around the technical limitations of [ERP A]. The biggest problem we have is that people think that [ERP A] has been thrust upon them, or they don't own it or they are not willing to use it ... I think the fact that the decision making process wasn't good enough had a major downside.

Academic B had concerns about the decisions and believed more background work may have pre-empted later implementation problems. He stated that 'It should have worked ... if we'd done more investigative work at the time we would have been more aware of the perceived shortcomings of [ERP A] now'. IS Professional B agreed and believed that an exploration of other alternatives, including building in-house, would have been beneficial. He believed the organisation should have 'decided not to implement an ERP or revisit it at a later date'. He explained that at best, there should have been a qualified recommendation, stating that:

We didn't have enough information at the beginning. We were led to believe we were buying an integrated application which wasn't the case ... We just had the wrong information. The people who were pushing the ERP were telling us what they wanted to tell us ... they were telling us the features. It was only when you scratch below the surface a bit, you get a feel for what it is actually doing and it was only when you started looking at the product [that] it looked pretty ordinary and disconnected.

Organisational support for the decisions was primarily limited to the executive levels.

Most regular members of the organisation were at best suspicious or at worst openly hostile to the decisions. IS Professional A commented that:

[The members of the organisation] were unsupportive about the whole process of how the project went about implementing it, and taking people from their substantive positions to work on the project and not backfilling. So it had a bad reputation from day one.

Academic A described on the lack of confidence in the decision making process within the organisation, stating that:

I think the [organisation] thinks the decisions were unsupported. As I said, even people who were on the selection panel and were part of the process seem to absolve themselves of responsibility for the outcomes of that process ... The organisation's view is that there was some kind of rotting going on and that we stumbled into [ERP A] for God knows what reasons, but it was bad. I don't think that's a fair representation of the process but that's what a lot of people seem to think.

One concern of the organisation was value for money spent. The IS Executive explained:

I think the formal part of the organisation thinks it was a good decision. There are areas within the organisation that who probably think that for the amount of money we spent, we didn't get an appropriate return.

Academic B concurred, stating that ‘I think everybody was thrilled that we were getting a new student system but they are all disappointed with what it has cost’. The cost element became a critical post-implementation factor once the senior executives realised how much it would take to support an ERP. IS Professional A explained that the senior executives in the organisation were ‘flabbergasted by the post-implementation costs’ and that it took nearly a year to fix mistakes. She explained that at one point, the senior executive wanted an exit strategy prepared to rollback the ERP implementation:

They wanted an exit strategy. They really wanted us to develop a strategy of us jettisoning the software and going forward with another one. Really and truly wanted us to spend some time and resources looking at that to see if it was worthwhile.

There is no indication from the data collected that the organisation would have had any better or worse outcomes from choosing another product. However, there are contextual and informational factors that can be linked to some of the negative outcomes.

The contextual environment in which the ERP decisions were taken was pressured and political. Although there was a real functional need for a replacement student records system, the haste in which the decision was taken in order to keep up with other educational institutions in Australia was ill-considered. Institutions that held back and made selection decisions one or two years after this implementation had better results. This was because the products were more mature, many of the teething issues had been resolved by early adopters and it was clearer which vendors would have long-term viability. Being a small institution and an early adopter was a negative combination of factors in this instance.

The environment was also one of hostility toward the IS department who were regarded as the cause of many of the systems problems. There is some irony that, by spending a considerable amount on the ERP project, only later did the organisation realise how much value for money the IS department had given them. The IS department had a history of working on low budgets delivering ‘just in time’ with the bare functionality. However, by their reactive nature, the organisation’s interaction with the IS department was usually when problems occurred. Broadly speaking, the organisation lacked trust and confidence in the IS department and many politically motivated individuals, especially from the faculties, actively campaigned against them. This negativity towards any project that the IS department was involved prejudiced outcomes.

A broad issue of limited internal expertise had negative outcomes in this project. A frequent theme in this case is that lack of experience, lack of a project culture, and lack of formalised decision making processes produced negative effects. Few, if any people in the organisation approached the ERP adoption decision with a clear understanding of the complexity of the issues. It is clear that few understood best practice when identifying the needs of the organisation and the role of an ERP. This lack of internal expertise produced a disjointed decision making process with unclear goals, lacking in transparency, which was ill-informed and susceptible to personal biases and political agendas. Fundamental to this was the lack of leadership and ownership of the decision making. This was clear from the comments of the evaluation team who did not take responsibility for their role in the decision making process. No single individual could be attributed with stewardship of the decision making process.

A relatively minor decision factor, vendor relationships, later proved important to decision outcomes. There were no existing relationships with vendor A however the organisation believed that because other higher education institutions were implementing Product A, they would be able to leverage off their support. This proved

correct in some cases and the organisation was able to have issues resolved because other institutions were experiencing the same problem. This was a clear positive outcome. However, because of the unique nature of the organisation and its determination to customise the system, vendor support was often not forthcoming. In this case, the organisation was one small customer competing for attention amongst other much larger institutions. The lack of an established one-on-one relationship with the vendor meant that problems could take a long time to be resolved. This led to dissatisfaction with the vendor and tension between the implementation project and vendor representatives.

The final group of factor-outcome relationships concern where information was sourced from and how it was communicated. Given the lack of internal expertise concerning ERP adoption practices, it is difficult to explain why so little information was collected or used in the evaluation process. Many of the information sources were of poor quality or from potentially biased sources. The extensive use of sales literature, product demonstrations and the advice of a vendor implementation partner was all subject to bias. One possible theory for the limited information gathering is that, as a number of interviewees suspected, the selection decision had already been made. This would also support the organisation's use of primarily informal decision making processes. However, even if this was not the case, there are other indications that information sources were poorly used. Although a functional evaluation was provided in summary form to the senior executives and Council in the organisation, the decision makers relied on the opinions of senior executives at another institution. Additionally, negative information about ERP A was being provided to the IS Executive by his IS department staff. This information was also sourced from technical staff at the external institution. It would appear that the selective provision and use of information that reinforced a preferred decision option was possible because of the filtering and dislocation between the layers of decision making.

6.4 Summary

This case presents an example of an organisation that underestimated the complexity, organisational impact and costs of a major IS project. This is evident by the disjointed approach taken to reaching the selection and pre-implementation decisions. Numerous contextual influences shaped the process and outcomes and these affected which information and information sources were used by decision makers. A summary of the factors and outcomes in relation to the contextual decision making model is depicted in Figure 6-1.

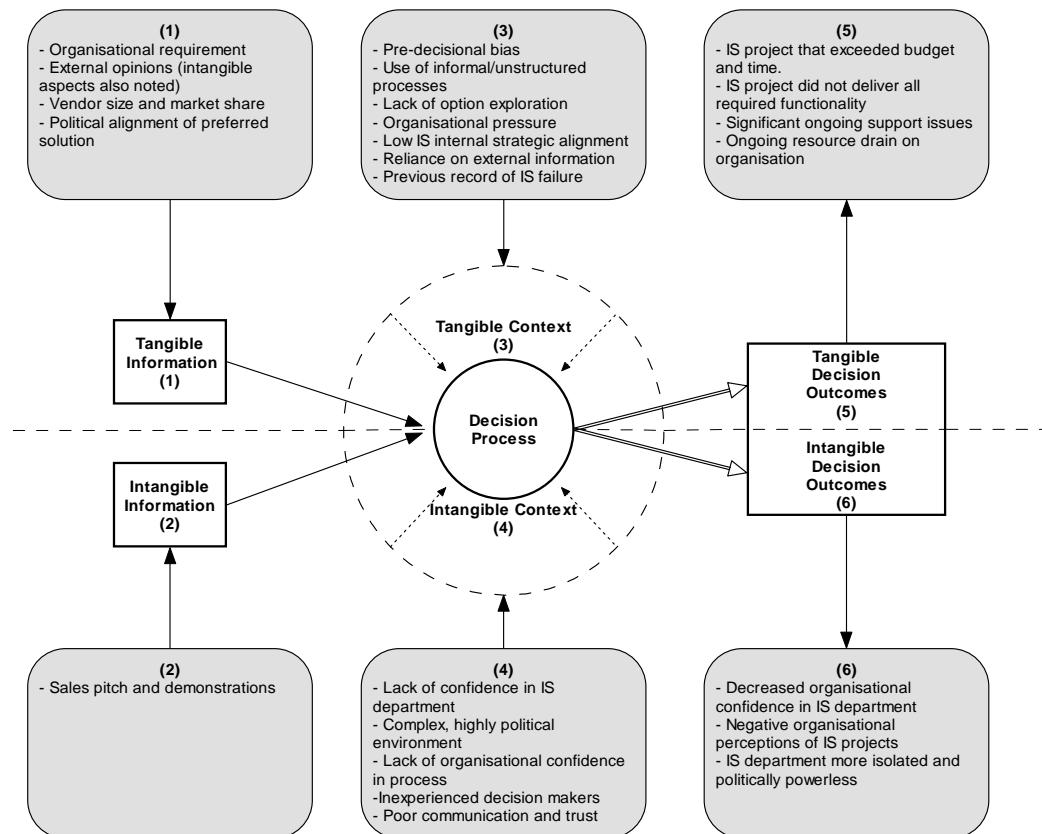


Figure 6-1 Summary of factors and outcomes within organisation C

This section briefly summarises the key elements of the case.

6.4.1 Decision making process

The decision making process was categorised as formal by interviewees however there is considerable evidence to suggest otherwise. A formal business case was not prepared for the ERP adoption or selection. Had this been formulated, the organisation would have been aware of the potential purchase and implementation costs of ERPs before entering the process. The process was not extensively planned and seemed to evolve from interactions between individuals and committees. Very little of the decision making process was ever documented and this later allowed individuals to absolve themselves from the negative outcomes. Individual biases and agendas were observable in the process, especially in the way the IS Executive pursued his own beliefs and preferences. This led many in the organisation to believe that the selection decision had been made before the evaluation process began.

A significant failing in the decision making process was the way in which the selection of the ERP was made. The use of a high-level functional analysis report in concert with the opinions of senior executives from an external site gave the organisation a false sense of security. This resulted in a purchase decision that began a cycle of escalating commitment. The post-selection gap analysis would appear to be counter intuitive and it was only on the completion of the implementation planning study that the organisation realised the true cost of the project. By this time, many in the organisation felt they were committed to implementing the ERP that they had already purchased, so there was never any real question of the project going ahead. It is notable that the process used during the selection and pre-implementation was criticised by external auditors.

6.4.2 Information sources

A small number of information sources were used during the decision making. These were almost entirely external because of the lack of internal expertise. The primary information source was from the vendors. This information was in the form of product

demonstrations and sales literature. At an executive level, the opinions of senior executives at another institution were used extensively in the decision making. However, information that conflicted was obtained from technical staff at the same institution, although not provided to senior executives. Consultants were the primary information providers for making the pre-implementation decisions concerning the project implementation.

6.4.3 Decision justifications

Justifications for the decisions were not formally documented except in emails and committee minutes. Tangible justifications provided for adopting the ERP centred on the need to replace the existing student records system and cost savings to the organisation through the implementation of business process reform and workflow. The size and presence of the vendor was also nominated as a justification for its selection. Functional and technical justifications including interface, common development toolset and off-the-shelf vendor support were also regarded as important.

The justification to exclude the option of building an in-house replacement to the student records system was an intangible factor centring on the lack of organisational confidence in the IS department. Interviewees explained that this factor was a common understanding or belief, but was not documented or stated formally.

6.4.4 Decision factors

A mix of contextual and informational factors interacted to produce the decision outcomes. Contextually, organisational pressure, politics and a lack of confidence in the IS department played a significant role in the way the process occurred and information was acquired and used. The organisation also had a history of informal decision making without a cost justification culture. Many of the people involved in the decision making were unaware of what an ERP was and how much it would impact on the organisation.

This radically altered the way in which they perceived the problem and options facing the organisation. There were also indications that some individuals had strong pre-decisional bias and were acting to influence the process.

Much of the initial decision making was based on high-level functional assessments. These came from viewing vendor presentations and sales literature. The high-level functional match, product customisability and user interface were all nominated decision factors. Vendor presence, size and relationships were also considerations. The opinions of external sources were a significant factor in the ERP purchase decision. At a high level, the reassurances from the senior executives at another institution were critical in Council's decision making. In contrast, the opinions from the technical staff at the same institution were largely ignored. At the implementation planning study stage of the decision making process, the organisation relied almost solely on the opinions and views of the implementation partner.

Many of the dominant factors in this project were human related. As discussed earlier, the organisation did not have confidence in the abilities of the IS department. Internally, the IS department was depleted of confidence and provided little resistance to purchasing an external product. The leadership of the division was actively promoting the off-the-shelf option with an obvious preference for a particular vendor. Some in the IS department knew that there were problems associated with ERP implementations, especially ERP A, yet their opinions were ignored. Communication was poor and many in the organisation were pursuing often misaligned political agendas. The organisation did not have the maturity or experience to approach and ERP adoption decision which resulted in a lack of transparency and an informal approach to the process. Many of these factors led to negative outcomes.

6.4.5 Decision outcomes

The senior executive of the organisation publicly supported the decisions and the delivered system. However, the implementation project ran over time, over budget and did not deliver all the required functionality. One million dollars was spent fixing critical problems and addressing functional requirements during the first year of the post-implementation period. A later two million dollar project was required to re-implement the finance system. The human resource system was never implemented and a third party product was recommended for implementation instead. The ongoing support costs for the organisation are substantial and place a significant drain on resources. The organisation never achieved the predicted cost savings.

Organisationaly, the selection and pre-implementation decisions were regarded as having negative outcomes. Many of the decision makers disassociated themselves from the decisions and outcomes.

6.5 Conclusion

This case has examined selection and pre-implementation decisions surrounding the adoption of an ERP in an educational organisation. The organisation was operationally complex and undergoing rapid growth. Following a series of systems failures and in the face of intense organisational pressure, a process was initiated to replace the legacy student records system. The organisation engaged in informal decision making processes distributed between the operational and management layers. There was evidence of political interference and bias towards Vendor A. Even so, and consistent with the literature, the decision making processes superficially appeared rational. The appearance of rationality was achieved by providing primarily tangible justifications for a decision, such as cost savings. Little information was gathered to inform the decision making. Most information was sourced primarily from vendors and other institutions. Senior executives operated in an environment of information under-load and were only exposed to sources that aligned with the preferred option of some of the actors. Many of

the decision factors were socio-political and the contextual environment played a key role in decision outcomes. Many of the outcomes in this project were perceived as negative and much of this can be attributed to poor decision making during the pre-implementation phase of the ERP project. The need for a replacement student records system was not an issue of dispute, however the decision to adopt, implement and modify a complex ERP consisting of student and finance systems is questionable.

Chapter 7

Organisation D

7.1 *Introduction*

During the early 1990s many Australian federal and state government agencies followed the American trend of information systems (IS) outsourcing. The objectives for this strategic change centred on cost savings through centralisation of IS budgets and creating a service provider model that would free government departments from maintaining separate IS departments. Many of these outsourcing models failed and were often associated with high cost and low service delivery. This case examines an outsourcing re-implementation via the selection of a seventeen million dollar managed services contract in an Australian Commonwealth government department. The organisational history that led up to the re-implementation will be examined alongside the decision making process and information sources. Justifications and decision factors used in the process will be described and decision outcomes will be examined.

7.2 *Overview*

Organisation D is an Australian Commonwealth government department. The department covers a number of separate sectional concerns within a single ministerial portfolio. It is functionally and culturally bureaucratic by nature and has a hierarchical reporting structure subject to direct ministerial intervention. The department maintains an IS department that services over fifteen hundred users spread over twenty locations throughout Australia and its territories. Due to the nature and sensitivity of the data collected, further details surrounding the purpose and type of operations performed at the department are not possible to disclose in order to meet the confidentiality agreement.

7.2.1 Interviewees

Three interviews were conducted within the department regarding the provision of a sixteen million dollar managed services contract. Additional information for the purposes of triangulation was obtained from extensive organisational documentation including evaluation plans and short-listing and scoring documentation. Interviewees consisted of a chief information officer (CIO) responsible for IS in the department (hereafter the CIO), the Section Head of Infrastructure and Operations (hereafter the Section Head) and a consultant engaged to assist in the evaluation (hereafter the Consultant).

The CIO had over ten years of experience in senior management roles in the public service with a broader background in IS technical service and applications delivery. He reported to the head of an administrative division within the department although had an informal reporting and advisement role to a committee that set the strategic direction of IS within the department (hereafter, the committee). The CIO directly supervised four Section Heads within the IS section. He described his expertise and role within the department as management, but had a keen interest in IS, stating that ‘I take a high degree of responsibility in the application architecture and the quality assurance of what the contractors are giving us’. The CIO primarily used IS on a day-to-day basis for email and office applications and occasionally used the corporate financial system. He believed that IS was ‘critical’ to the operations of the department, but acknowledged that ‘without those systems, we could still do those things [core operations], but the department would have to be twice the size and it would be done very ineffectively’.

The Section Head had extensive experience working in the public and private sector in IT service delivery. Before joining the department, he had worked on a large government outsourcing project as an account manager. He reported to the CIO and at

the time of the project, directly supervised a small team of eight people involved in the evaluation process. He described his expertise as IT service delivery and was quite skilled and confident with IS, although only used basic office applications on a day-to-day basis. He believed IS was not the core business of the department but a key strategic player that underpinned business operations. He believed the department could operate without IS, but with compromised efficiency.

The Consultant had over thirty years of experience in the public service in procurement and administrative processes and had been involved with Commonwealth outsourcing contracts since 1998. He reported to the CIO and during the project, project-managed the administrative requirements of the evaluation process. He described his expertise as the financial and corporate capability assessment of outsourcing evaluations, remarking that ‘I have a good understanding of the political, commercial and administrative dimensions of that [outsourcing] activity’. As an external consultant, he was not in a position to comment on the strategic importance of IS to the department.

7.2.2 Organisational history

In the late 1990s, a number of Commonwealth departments had become involved a strategic shift in IS management and delivery. This shift entailed contracting all or most IS services to external organisations. This process is commonly referred to as outsourcing. Organisation D had joined with a consortium of other departments and had entered into an outsourcing agreement with a large corporation. However, this was problematic, as the Section Head noted:

That first chunk of outsourcing had lots and lots of problems ... it was a big-bang approach but no two departments were the same [no two departments had the same needs thus there wasn't a good fit] ... there were a lot of contractual requirements that were pretty hard to deliver ... everyone learns from their

mistakes ... but most of the departments in that group didn't want to extend ... as it turned out, [the outsourcing company] was ceasing to exist so it was virtually legally impossible to continue.

The Section Head also noted that the outsourcing arrangement had led to other problems. These revolved around a lack of in-house IS knowledge and a lack of control of outsourced projects, with the Section Head remarking that:

From the project manager down to the tester, they were all just contract staff
...They really did outsource everything, all the knowledge and all the skills.
There really wasn't anything left here in-house to do except check invoices.

He went on to explain:

There was a program office approach before when we arrived where they really just provided a desk and some facilities to contractors who came and delivered projects. They were really disengaged with what they were delivering ... the technologies that were being delivered were left largely to the contractors or companies that had won the job. There were no defined standards so what we ended up with was a whole lot of disparate systems which now we're trying to clean up but have left us with significant support issues mainly because most of the people that developed the systems have moved on.

The minimal in-house IS presence and poor ownership of the IS projects led to money being wasted on expensive and unnecessary documentation, analysis and project management. As the Section Head noted, 'They were very well documented projects ... the project management overheads and the analysis overheads were significant ... it was paralysis by analysis'. He went on to add 'They [the department] were taking a soft

approach with the outsourcer, they weren't confrontational, it was more about the relationship, even if they [lost out on] service'. Due to the increasing costs and poor service, the completely outsourced approach was deemed a failure by the senior executives in the department. In order to remedy the situation, a new CIO and Section Head were recruited. The Section Head remarked that:

[The CIO] and I arrived within two weeks of each other in the department. We actually wound up a few projects that were significant failures ... we've changed the approach to projects significantly since we got here.

The CIO agreed, adding that 'We killed off every project when I came here', remarking that:

When I came here, we started all over again ... that was my reason for coming across here ... they had a lot of problems ... they were outsourced [and] in a particularly nasty situation where they were in a cluster situation [shared outsourcing arrangement] ... All their projects had gone off the tracks ... we had a mess ... we had financial problems and we were going out the door backwards and IT was a sizable chunk of that and no one knew how much the new model would cost us. We knew that this contract with [the incumbent vendor] was essentially coming to an end, but they had had a much bigger outsourced model, everything was outsourced where as now, we've got a better fit ... so we've grown our own internal skills up and recruited so that we've got maybe thirty people on the books now as opposed to nothing before.

When the CIO was asked why he thought the previous outsourcing arrangement had failed, he commented on the lack of understanding and control over IS. He noted that:

One of the reasons, and it wasn't unique to this department, is when departments move[d] to an outsourced model ... they really didn't understand outsourcing and the government got some pretty poor advice from the U.S. experts ... They outsourced the thinking process as well as the operational process. And it wasn't just strategic; sometimes it was just a lot of day-to-day issues. When they realised that they still needed the CIO, they brought in a consultant to be a CIO for a while and ... it just really didn't work for them ... a large number of departments fell into the same trap "oh well, we've outsourced this to company x, so all of our problems will now go away" ... they realised fairly quickly that these companies didn't [care] about their strategic direction unless there was a quid in it for them.

When they [the consultants] did try to come in with strategic plans, it was that huge mega-buck visionary stuff ... replace the other thing with the latest and greatest every couple of months ... so there was no cohesive plan about how it was all going to happen. And that plan doesn't have to be a complicated one, half the time it's just in people's heads where you want to go ... there was no one in control I suppose.

Part of the problem was locality, with many of the major outsourcers being located either only in Sydney or overseas. Many of the metropolitan sites were poorly serviced and there were considerable complaints from the regional centres. As the CIO remarked:

[With respect to making] a lot of the more technical decisions, it is like one of those Chinese plate jugglers ... it's a case of how many plates can you have in the air ... there's always something happening ... you can't move that out [of

the department] and expect some company based in Sydney, if you are lucky, California if you're not, to be paying attention to your strategic direction.

With the imminent expiry of the existing outsourcing contract and the arrival of a new CIO and infrastructure Section Head, a project was started to review the outsourcing model to provide better IS services in the department. As the Section Head remarked, 'We were pretty keen to refine the outsourcing model ... learn from our mistakes and try to get a better fit for us this time round'.

7.3 *The managed services project*

On arriving in the department, the CIO became aware that the department had engaged a group of consultants to run the process of designing the outsourcing model and choosing a new outsourcing vendor. The consultants had begun to formulate a number of recommendations, many of which failed to align with the beliefs of the new CIO and Infrastructure Section Head. This review was halted, as the CIO remarked:

We sacked them. Mainly due to the fact they were not paying attention to what was right and what was wrong. They just simply came in with their views of what are contemporary models rather than saying "look at the outsourcing that has just gone before".

Before continuing, the CIO qualified the remark by stating that 'I like outsourcing, I'm not anti-outsourcing' but his concerns related to the lack of fit between the proposed model and what the department needed. The Section Head confirmed why the initial review was halted. He remarked that:

Their [the consultants'] focus was on how do we need to manage it rather than on what do we need to outsource' however that '[Our new approach] was to

bring some of these things back in-house where it doesn't make any sense to outsource.

The CIO explained why the consultants had failed in their review:

They [the consultants] were simply saying "this is the model I think we should adopt". "Why?" [we asked]. "Well, I went to a seminar in Sydney a couple of weeks ago and they had this up on the screen". "Well" [we asked], "have you analysed what the department wants?"

Part of the strategic intent was a need for a customised fit and a return to control of IS services. The CIO explained:

We tried to move away from the word outsourcing ... we said "this is the way it's going to be done – you will deliver these services from here using this architecture using our designs". They could finesse them – we were not particularly fussed on brand but we had power of veto.

It is managed services basically. Everything must be provided on our premises. Everything has to be done as we design it. We don't expect them to provide system architects or anything. If necessary, we'll use other companies, third parties, to do that work.

The CIO summed up his remit as the removal of the existing outsourcing model and the introduction a new one:

The main aim was to get rid of that one, bring in a new one, a new model that worked better, kept the prices under control, and removed all forms of risk and ambiguity that was always causing us problems with outsourcing in the past.

As part of the early changes made to develop a new outsourcing model, strategic governance was strengthened by increasing the role of the committee as an active sounding board for proposed changes. To ensure a successful evaluation and deployment of managed services, extensive changes to the department's IS project methodology were also introduced.

Apart from implementing a new outsourcing model, there were technical and non-technical requirements to be met by the new managed services contract. The technical environment was simple, as the Section Head explained:

Ninety percent [of users] use IT as a word processor and to check emails ... it's not a very sophisticated department as far as IT goes ... there is not a lot of requirement for anything more than a PC that does word processing and email .. there are a few business systems but they are largely grant management systems ... simple databases etc ... It is a reasonably simple network, simple environment, it's quite clean.

However, a requirement was a complete refresh of hardware, software and other key infrastructure. Although a pragmatic requirement, as the existing infrastructure was old and out of warranty, this was also to align the managed services contract with a four year refresh of infrastructure. The Section Head explained:

At the time, when we were changing contracts over, we purposely went for a clean slate and replaced absolutely everything, desktop, back-end at the same

time. One of the problems with the previous contracts was ... they had the concept of refresh, technology refreshes during the term of the contract. It never turned out clean; there were always commercial arguments about cost, about what equipment you were going to get ... the inconvenience to all the customers doing it mid-contract. We specifically decided to align the contract term with the technology term so when we refresh technology, we change contract at the same time.

The key non-technical requirement from the new managed services arrangement was a simplified contract. The previous contract had led to constant disputes, mainly due to its ambiguity. The Section Head explained:

One of the central things from the start was that we wanted to simplify the contract, we wanted to remove all the ambiguity from the contract, we didn't want to have to be having contractual arguments all throughout the term. We wanted to really carefully spell out what we wanted and what it was going to cost.

In order to simplify the new arrangement, the contract was broken into approximately a dozen areas of functionality including desktop environment, helpdesk and data network. These were specified in a request for tender (RFT) issued in mid-200n. The evaluation process took approximately four months and consisted of a two-phase process of short-listing and negotiations. Six vendors (Vendors A – F) responded to the RFT with bids (Bids A – F respectively).

Vendor A is a subsidiary of an International IT services corporation partnered with Australian corporate shareholders. The tendered cost of their bid was approximately twenty million dollars over four years.

Vendor B is an Australian owned and controlled IT service provider and is classified as a small to medium enterprise (SME) under the Commonwealth's industry development guidelines. The tendered cost of their bid was approximately seventeen million dollars over four years.

Vendor C is an Australian owned and controlled IT service provider and an SME. The tendered cost of their bid was approximately seventeen million dollars over four years

Vendor D is a wholly owned subsidiary of a public company listed on the London and Amsterdam Stock Exchanges. Vendor D proposed to partner with a third party for hardware provision and other services under the contract. The tendered cost of their bid was approximately thirteen million dollars over four years.

Vendor E is an Australian public telecommunications and information services company. Vendor E proposed to partner with a third party for the provision of project management, auditing and documentation services during the transition and transformation phases and another company for the management of the printer fleet. The tendered cost of their bid was approximately twenty-five million dollars over four years.

Vendor F is a subsidiary of a wholly Australian owned company and is classified as an SME. Vendor F proposed to partner with a third party to support a number of the department's regional and remote sites. The tendered cost of their bid was approximately twenty million dollars over four years.

A final recommendation to contract Vendor B for approximately seventeen million dollars in services over a period of four years was made to the committee. This recommendation was endorsed.

7.3.1 Decision making process

The evaluation process was performed by the tender evaluation committee. A small team including the CIO, the Section Head and the Consultant evaluated the responses in accordance with a tender evaluation plan. Key decisions were taken by the CIO and the Section Head, as the Section Head stated, ‘At the end of the day, it was [the CIO] and I who sat down and went through everything all the time ... I was responsible for all the technical evaluations’.

Vendors were required to respond to the statement of work, as set out in the tender. The statement of work prescribed the technical architecture and support model that all vendors were required to incorporate in their proposals. All vendors were asked to present to the evaluation committee and to provide written responses to questions in order to clarify aspects of their bid. A minimum of one reference site was contacted for each vendor to obtain information regarding previous outsourcing contract performance. A score-card methodology was used to evaluate key criteria. These criteria were grouped into eight technical and non-technical categories including price, risk and a comparative assessment against the technical requirements. Documentation was reviewed that provided evidence of these activities. This included the initial short-listing and final selection reports and scorecards.

On conclusion of the first round of short-listing, three of the vendors’ bids were eliminated and a short-listing report was produced. This report detailed the score cards and further explanatory justifications. Bids A, B and C remained. The final phase of the evaluation involved further negotiation with the short-listed vendors and refinement of the proposals. On completion of the process, a final evaluation report was produced that recommended Vendor B’s solution. It should be noted that the CIO was insistent that the final phase of the selection was not about lowering the price. He explained the

reason for this was the negative consequences of creating commercially unviable contracts:

One of the faults in previous tenders across government was where we've driven down the value of the contract to below commercially viable rates and it has become a loss leader ... It had to be viable ... So if somebody was too cheap, as you can see one of them - they didn't get a look in – you can see it is a loss leader, they cannot commercially deliver those services for that price.

In practical terms, the final decision of selecting Vendor B rested with the CIO as the chair of the evaluation committee. As the Section Head noted:

[The CIO] made the decision. He signed off on the evaluation report and took it to the [committee] for endorsement ... [The CIO] was very keen not to own the process completely, to get buy-in from that governance body because they had representatives from every business area. So, we took them through all the bids, the pros and cons of each. We took them through some of the detail. For the last three, we even had them give their final presentation to the committee ... [however, ultimately] [The CIO] made the decision, it went up for endorsement, and then to the CEO for the signature on the contract.

The CIO supported that view but commented on how much he valued the role of the strategic committee and the head of department, noting that:

I needed these people on board, and the ones we chose [on the committee] were the ones who were the most badly affected by the previous service provider ... and it has worked really, really well because they own the process ... they were part of the decision making ... when we put things forward to them, they asked

questions ... we asked them to personally sit in on some of the presentations from the bids ... [although technically] the final decision making in this organisation, under the Act [of Parliament] is going to be the secretary.

Two key pre-decisional biases shaped the evaluation process. The first related to the removal of the existing outsourcing model, and in particular, the incumbent vendor. The CIO remarked that 'When I came in our main priority was to get rid of the incumbent service providers ... and that was what this tender process [was about]'. The second bias concerned how large a client was the department was going to be to the vendor. It was important that the department would be a significant client and as such, be able to demand and receive quality service. The Section Head explained:

One of the things in the back of our mind ... we're a reasonably small organisation, we're not a [list of large government departments]. We were looking to be a large customer for someone, not a small customer for a larger organisation. We felt we'd get a better focus as customers if we were a significant customer for someone ... It stands to reason that if you go with [a large multi-national] with an organisation of this size, then you're going to be a blip on their radar, you're not going to get the focus, you're not going to get the resources.

We had that in the back of our minds, but we still went through the evaluation process. As it turned out, there was a large bidder in the last three anyway, which was good because it gave it some perspective.

Although there were elements of pre-decisional bias, all three interviewees were keen to stress the formality of the process. The consultant described the importance of the documentation process:

During the whole process, including the evaluation, notes were taken of all the evaluation meetings and reports were prepared and submitted to or discussed with the steering committee and submitted through the steering committee to [The Secretary].

The CIO supported this, stating that ‘We went through a very formal process which was very well documented … we had this presentation, people made comments, this is what we did’. However, he went on to identify informal aspects of the process:

When it got very close between the two bids, we brought them in and I’m saying “look, I’ve listened to these people for a few months. Get some fresh heads in here and I’ll sit off to one side and you now interview them and see if you can help split them as well” … So there was informality in some of our informal discussions, but the process itself was very formal.

The CIO went on to defend the formal part of the process and explain its importance in relation to probity and appearance:

I put a particularly strong emphasis on the probity process because there’s nothing worse than getting to the end of an expensive and dragged out process, only to trip up on some tiny little issue. So at every step, I made sure that the probity was signed off so … we got really, really formal in that. There were never really any informal processes involved between us and the bidders. We would never talk to any of the bids without it being on the record and at least a second person being there. In fact, we tried not to talk to the bids without our probity guy being with us.

I'm the complaints officer for a number of tenders ... and I've seen bids fall over and have to be redone ... because we are the public service, we are expected to have very, very high standards ... and there's many avenues for people to complain about process ... particularly to Parliament [and to] ministers.

The Section Head supported this, stating that:

We were very conscious that we weren't open to any questions raised about the process. We really made sure the process was airtight. There had been a couple of examples around town where they just got themselves into trouble, so we were very scrupulous about the process. It was all written up meticulously. All the evaluations were done according to the methodologies exactly.

All the interviewees had extensive experience in previous outsourcing contracts and evaluations. As such, they used these skills to develop the evaluation process. All regarded the process as having been successful. There were a number of contributing factors to this success.

The formal process, documented in the evaluation, left little room for ambiguity between the vendors and the department. The consultant explained:

It was very tightly managed in terms of the statement of requirements and the process that we went through ... Working in this process was very good as we had a set of very tightly defined requirements. There wasn't the ambiguity that some other tender processes do have. There was limited room for tenderers to provide alternative proposals.

The Section Head supported this, stating that:

We had a good process of going back to the vendors for clarification, it was very structured. All the administration was spot on. We had pretty good relationships with the vendors by the end of it.

The timetable in which the process was to be completed was also clearly laid out. The Consultant explained:

We made it clear to the tenderers that we were working to a very tight time frame in order to get the evaluation finished, the contract signed so that we could start transition with a view to hand over when the incumbent's contract had finished.

Due to this clear definition of a time frame, the process was conducted according to schedule, as the Section Head confirmed 'We reached a decision quite quickly ... probably about four or five months'.

One of the interesting aspects of this evaluation was how heavily weighted the evaluation committee was with technical expertise. This affected the way in which the request for tender and statement of work was defined as well as setting the expectations of service delivery. The CIO, who believed his opinions impacted significantly on the process and outcomes, explained:

We're IT professionals – shit happens, we understand the IT world. You can't insist on servers running at ninety-nine point nine-nine percent availability when you are not prepared to invest in that technology in the first place. So people that sign contracts that say they'll do that have simply got their fingers crossed.

What a silly way to start the contract – you may as well put something reasonable.

This level of understanding stemmed from technical experience and an understanding of the pitfalls of IS outsourcing, both from client and vendor perspectives. It also was reflected in the beliefs of the other interviewees on how much they thought their opinions affected the evaluation outcome.

The Consultant believed he had a high impact in his areas of the evaluation, stating that:

I think they were significant in terms of the criteria that I dealt with – industry development, corporate capability and to a lesser extent, financial. [The CIO] had a strong interest in that side of it and that was probably the focus of our negotiations when we were getting down to the final decision. Certainly in those two I wrote ... they were not changed in any material way.

The Section Head also believed his previous experience had placed him in a position to significantly influence the evaluation, remarking that:

I think I had significant influence to be honest ... I'd seen how a lot of these contracts had gone wrong. I knew pretty well what didn't work and I specifically knew, because of my experience on the vendor's side, what was unreasonable to ask for. We were trying to get a contract where the relationship was more important than service level ... So, we were conscious that we didn't ask for unreasonable things that were hard to deliver, while at the same time we asked for very specific responses about what we did want and how they were going to deliver it.

The previous contract had ... pages and pages of ethereal requirements ... it didn't really make any sense, they never really knew what they were delivering and people tried to hold them to it ... so we tried to cut all of that out.

It is clear that in this decision, a formal evaluation process occurred that was shaped by a number of highly experienced individuals. It is also clear that this experience immediately introduced pre-decisional bias into the process.

7.3.2 Information sources

A limited set of information sources were used to perform the evaluation. The primary source was the evaluation team's own experience and expertise. The Section Head explained that 'Really [it was] just the expertise we had on the team to be honest ... We've been IT professionals for sometime so really it was just our collective knowledge'.

Other sources of information included the tender documents themselves and legal advisors. A final source of information came from reference sites; however these had limited value and were mainly for establishing how well the vendor could work with clients. The Consultant explained this by saying "They were more in the nature of confirming the ability to work with an organisation, rather than the detailed technical capability of the companies".

The CIO confirmed this view of reference sites, stating:

We paid virtually no ... weight to reference sites. We just didn't bother about that. We went through the process to make sure there were no glaring omissions ... but we're not particularly interested if a referee said they were good.

When asked why reference sites provided such limited information, he replied:

Because we know the sort of people they are going to put as references. We'd rather go and ask a user of that service rather than someone who's in a relationship with [the vendor]'. They invariably always use the contract manager of the successful contract and that contract manager realises quite correctly that the relationship is absolutely critical ... they know they their comments will be on the record and we will make them available if asked ... through FOI

Even though a small number of information sources were used, most were high quality expert opinion and judgement. The organisation's confidence in its own internal resources is a notable factor in the way in which this decision was made. It demonstrates the principle that a low level of uncertainty associated with a decision will lead to less searching for external information sources.

7.3.3 Decision justifications

Nominally, the justifications for the selection of Vendor B were detailed as part of the final evaluation report. These were based on the results of the complex score card system that placed Vendor B in a slightly more advantageous position than its nearest rival, Vendor C. However, the Section Head best summed it up by saying 'It was really just about the service, the price and the solution'.

He went on to explain that the technology fit was a key justification:

At the end of the day, the company that won ... their technical solution was sound, what they were delivering made sense ... they weren't giving us freeware, it was established technologies.

Price too played an important role. However, it was important that it was a commercially realistic contract, as the Section Head explained:

It was reasonably priced ... we certainly weren't looking for lowest bidder ... in fact ... we specifically didn't want the lowest bidder ... we didn't want someone to come in that would lose money for four years so that we were constantly in a ... fight with them over cash.

We wanted to make sure the vendor was making a reasonable commercial profit ... we didn't want someone to come in and buy the business and then constantly be at us for money the whole way through and we obviously didn't want someone who was too expensive. In the end the successful bidder was somewhere in the middle.

The Consultant supported these comments, noting additional factors such as proven outsourcing experience, willingness to negotiate and their ability to provide information:

In the final analysis, cost between [Vendor B] and [Vendor C] ... was not an important differentiator. In terms of where we got to we found that ... [selected vendor] had runs on the board, they had a proven track record, they had been more responsive during negotiations to addressing the sorts of issues that we were interested in and they were marginally better priced than the second [vendor].

[Vendor C], although they brought what we thought were their "A Team" to the table, were unable to respond to some of our issues ... they had to go away and seek advice from higher up within their chain. A couple of times they totally

misunderstood what we were on about and that led us to believe that the fit, not culture but something like that, between them and [the department] wasn't as good as the other companies.

The Consultant did state that cost became a justification for Vendor A, remarking that 'The third company was primarily discounted on price'. Given that Vendor A's bid was over three million dollars more than either Bid B or Bid C, this does not seem unreasonable.

As could be expected from the rigid and thorough documentation process, most of the justifications were clearly documented. However, the mention of the commercially viable tender was never expressed in such terms. This factor was alluded to in other evaluation criteria such as the commercial stability and viability of the vendor itself. This is not surprising given the difficulty of expressing the more abstract factor of the commercial viability of the contract.

7.3.4 Decision factors

Although the decision was a result of a formal, structured evaluation, there was considerable evidence that a number of pre-decisional factors and influences shaped the decision and the perception of information. The most basic of these was the need for a simple contract that was clearly understood by both parties. This meant that the department needed to establish a certain type of relationship, as the Section Head explained:

The previous contract was, well, like over forty foot high. There were so many different terms and conditions in the contract, so many different ways we could be charged, so many ambiguous clauses ... if you wanted to argue every single issue, you'd be there forever.

With this contract, the whole idea we took was we didn't want to open the contract again; we wanted to set it up and leave it there. If we had to go back to it, we had to go back to it, but we wanted a relationship where we didn't have to go back to the contract.

Thus the type of relationship that could be established between the vendor and the department was a constant factor. This was clearly demonstrated by the belief that the size of the vendor was going to be an important factor, as the Section Head explained:

A lot of the problems with the previous contract ... was that no one remembered what the intent was of a lot of the clauses in the contract because they were so ambiguous and hard to actually define ... it was open to interpretation the whole way through. When I was on the vendor's side I remember a lot of discussions and arguments where we would be defending our position saying "no, we don't have to deliver that, it'll cost you" where as the customer is saying "no I specifically remember sitting in a room with such-and-such and this was the discussion and this was the intent of that clause". But because it wasn't in the contract, and wasn't documented in any other way, it fell by the wayside. If we had a smaller company delivering the service, that was less likely to happen.'

This view was supported by the CIO, who admitted that the vendor size factor was informally acknowledged as part of the evaluation:

The informal one ... and it doesn't come out in the documentation ... cause it is gut feel instinct ... I have a very strong view that it is really good to be a big customer. And if we went with a large multinational, you're not a big customer

– we're only fifteen hundred seats. We're a very small customer. So being a very big customer, I think is very, very important.

The effect of this was evident when it came to separating the last three vendors. The Section Head explained:

At the end of the day when we were sitting down with these last three ... we felt that the company that won was more willing to be flexible, to adapt to what we wanted. We were after someone who was nimble, someone who was able to adapt to our environment. I mean, we were looking largely at a body shop approach anyway where they just supply a specific number of resources for a specific number of tasks onsite and that's it – at this price. But it was really how flexible they were to meet our needs, which sort of ties back to ... being a big customer for someone rather than a small customer. We felt that the company that won was a little more nimble, a little more able to meet our needs than the other two.

Related to the size of the company was the preference for an Australian company, as the CIO explained:

I have a strong view that having an Australian company, even though it is very hard now ... especially with the FTA [Free Trade Agreement] being there ... to force an Australian company ... give them some thorough industry development opportunities to weight it in their favour ... because of the size of the market place, an Australian company is best suited to us.

The reason why an Australian company ‘suited’ the department was not just related to size, as there were issues of cultural fit that will be examined further later.

Background knowledge of the vendors' human resources was also acknowledged as having an effect, with the Section Head remarking 'Some of these bidders' specific technical resources that were putting these bids together were known to us... We were aware of some of the skills involved'. The evaluation team were familiar with who the vendors were and what resources they had. The vendors were aware of this and this led the CIO to make the interesting remark:

I don't think we've ever approached this with the expectation of being very surprised with the result ...If you had asked me who wouldn't be in the running, I probably couldn't tell you who was going to win, but I could probably tell you who wasn't before we even issued the tender documents. Some of those companies were smart enough to realise this is a bad fit, this is not where they want to be and not even bid.

The issue of fit was an important decision factor. It was important that the vendor was seen to be adhering to the requirements set out in the RFT and not tendering a standard outsourcing service. The CIO explained:

Outsourcing is [where] you basically give everything up ... it was different ... and one of the criteria was how much attention had people paid ... that this was a very, very personalised style of managed services or outsourcing. If they came back in with fairly broad brush "well, we really didn't pay attention to how you wanted it done – we're doing it the way we've always done it" then they didn't get much of a run.

A key group of decision factors related to the technology solution being proffered. The CIO explained this was because 'We're a bit geeky – professional snobs so we know

good kit from bad ... so when people try to fob us off with pretty second rate back-yard technology ... it tended to influence us'. He believed it was 'important that we got the right technology ... it had to be a known brand'. The evaluation team went to the extent of negotiating specific technology brands as part of the final phase.

Ultimately, it was the overall technical solution that was important, with the Section Head remarking that:

On the technical side it was an assessment that the solution was technically sound and made sense ... it had the appearance of being designed rather than being thrown together by an account manager during the bid process at midnight one night ... there was some thought behind it.

One consideration that was difficult to document was the viability and future of the vendors. Although a viability risk assessment was performed as part of the evaluation, the IS marketplace is fluid and vendors frequently merge, buy out or are bought out by other companies. This can impact on existing contractual arrangements. This was a concern, as the CIO noted 'You can only go through a formal process to look at their viability and you can only assess them on the day as they are but it is certainly in the back of your mind'. Part of this concern related to a fear that the incumbent vendor may purchase one of the short-listed vendors, as the CIO explained:

You get a bit worried ... because the market is so volatile ... the long-term viability of these companies ... There were rumours that [Vendor C] was going to be bought out and they got bought out by [the incumbent] ... the moment the market starts to hear those rumours ... it doesn't impact on the decision ... it doesn't appear there, but in the back of your mind "[Vendor C] – [incumbent] – oh shit, we're back there again".

This concern about a potential return to the incumbent, by default or otherwise, was repeated throughout the interviews. As the Section Head remarked, ‘The previous relationship was certainly poisoned’. Part of this related to a major technology failure in the delivery of regional services. The Section Head explained:

They were using [a particular technology] for all the regional offices. That was a monumental failure in the eyes of the client because it was really problematic and that poisoned the relationship with the [incumbent] outsourcer ... because essentially the outsourcer became synonymous with that particular technology solution by name and to the extent that we still can't consider implanting that technology here, even if there is a really good business reason to do it ... because as soon as you mention the word, the history gets dragged up and people start to get bitter straight away.

It certainly drove our approach to service delivery in the regional areas to a large extent; with what didn’t work ... certainly it drove our approach to remote access because the whole department was poisoned to that technology because it had been such a monumental failure.

This led to a focus on making sure that the preferred vendor could deliver a high quality product at regional sites, as the Section Head remarked:

Supporting the regional sites was a reasonably key issue. I guess to some extent politically that was ... it was all tied in with that technology failure but ... one of the more vocal people of the [committee] was the head of the regional services area which ... had almost all of the staff in the regional offices. She was particularly aware that her staff were very vocal in their opposition to the

previous solution. So she was very keen that we deliver that service better ... if anyone was asking questions at the strategic IT committee level, it was her – about the remote solution.

The incumbent's technology failure had another very clear outcome: its bid was never going to win. The CIO explained:

I have to say ... even though [incumbent] put in a really good bid, as the incumbent, albeit in a different guise, they were never going to get a run. You can't walk away from this absolute smoking gun and say "No, no, we had a different view to things. When we come back in next time, it'll be so much different ... It's like sacking someone and hiring them back the next day ... it doesn't make a whole lot of sense and it'll raise more questions than it answers.

Cultural factors such as the way vendors interacted and how well their organisation fit with the department were regarded as important. The evaluation team were impressed with the preferred vendor because they brought their technical engineer into the process. He was available to answer technical questions as required and this made a significant impact. The team believed that it was effectively like having a preview of the type of people and level of professionalism that would be provided during the contract. The Consultant remarked that 'We felt that we were dealing by and large with the people we'd be working with on a day-to-day basis over the initial part of the contract' but that:

With other vendors, we had the impression that some back-room boy had developed the technical side of it and they brought the sales team in to talk to us. There was sometimes a disconnect between the two.

The Section Head confirmed this, remarking that:

We had one particular bid manager that would talk at the start of every meeting but if you asked any question, he couldn't answer it ... it had to go to someone else. That was the larger organisation [Vendor A] in the final three. And that was the kind of thing we were specifically trying to avoid. We didn't want a team to come in and do the bid and [another] team to come in and deliver the service. We were hoping for a smaller company where the same people who were doing the bid and doing the design, actually stuck around and were involved in the service delivery as well.

The perceptions of how the bid teams interacted was important. This was on two levels, personally and culturally. Personally, it was important for the evaluation team to like and relate to the bid team, as the Section Head explained:

There was the bullshit factor ... personalities always come into it and when you have a bid team coming in ... some bid teams are much easier to talk issues through than others. Some bid teams come across as used car salesmen ... they fly in from somewhere else to manage the bid, they don't know us, they don't really have an intimate knowledge of the bid themselves, they're just talking heads ... and that does get annoying.

The second level was the cultural fit between organisations. However, as the CIO remarked, 'One thing that is sort of very hard to pinpoint on a quantifiable basis is cultural fit'. He began by explaining that 'We're not an IBM, we're not a suit brigade [so we have to ask] "is this organisation a good fit culturally?"'. To gauge the cultural fit, he took cues from his peers. He explained further:

When we brought them all in to present ... you just watch, you listen ... this is the stuff that is never written down ... [for example], "do they came across like a bunch of Mormons in suits who were preaching to us?" ... it goes back to that cultural fit ... [we need to know] how do they really work?

Two of the vendors had a good cultural fit; however there was a lack of connection with the larger multinational. The CIO explained:

The two front runners who were [Vendor C] and [Vendor B] ... they came across as a pretty good fit, small Australian companies ... and yet when we brought in someone like [Vendor A], they were very, very different and people started to [react negatively] ... and a lot of these people had had experience with these companies ... sure, you don't write these things down ... but it washes ... when you can see that there is a bad connect, you don't just force it, you just let it die.

When asked how this could affect or be reflected through the formal evaluation and score card system, the CIO replied that 'It changes perceptions ... It influences the decision ... you know, a three and a half becomes a three ... it sort of just washes that away ... we're just human beings, that's just the way it is'. Cultural fit was an important factor used to separate the final two vendors, as the Section Head remarked 'At the end of the day ... scores, they were just ahead, but we just felt they were a better fit'. Gut feeling also seemed to be the key factor in determining the preferred vendor. It was a close decision between Vendor B and Vendor C, as the Section Head noted:

To be honest, there wasn't much in it ... It was really very close between the first two. They were similarly sized companies, similar sort of stories, similar sort of experience in the market, both reasonably good reputations. It was really

quite close. But we just had a better feeling about one over the other and [the CIO] and I had dealt with ... the successful one previously as well. There was a little bit of the devil-you-know in that as well'

The CIO agreed, stating that:

At the end of the day we don't feed these into a spreadsheet and look at "oh, that surprised me, look what came out" ... it is a very human process ... we are looking for people to provide us with services for a long time where we are going to build a relationship with ... where they are going to provide very intimate services, where they come into your home and into your workplace to provide IT support. It is very sensitive.

It is evident that a significant number of inter-related contextual and informational factors were used to make the decision. It is also evident that many of these are intangible and were not documented in the justification.

7.4 Decision outcomes

There were positive outcomes from both the evaluation process and the selection of the preferred vendor. The most immediate effect was on the governance and decision making processes, with the CIO remarking that 'It triggered the start of a much more robust IT governance process in general'. The Section Head agreed, stating that 'It has certainly re-enforced the need to be that meticulous with all of our decision making'. He went on to explain:

The importance of documented evaluation methodologies, documenting the process from woe to go ... if there is ever outside scrutiny, we need to be able to go "this is how we did it – these are the decisions, this is why" – you've got to

be squeaky clean – it's not about appearing to be squeaky clean, it actually is – being able to say, hand on heart, “yes, the process was fair, that's who won” – it has certainly re-enforced that.

We just can't get away with [not documenting process]. There's just so much outside scrutiny. We've got the Senate who can just drag us up and ask us questions at any moment. We've got all sorts of government committees, opposition committees who can say “what's this about?” It is not common, but some companies like to shoot themselves in the foot by complaining to Parliament about decisions – it's not going to help their cause for any future decisions – but it has been known to happen – and if you've got an opposition member making noise to your Minister about a decision about an IT contract, then your life's just going to be a nightmare.

Organisational, the change in outsourcing model and the decision to resume strategic control of IS has been beneficial, as the CIO explained:

Since we've done that, all the projects have worked well … they've come in largely on time and on budget … some have been under, some have been over, but all have been within agreed contingency levels.

He went on to add that confidence had been restored in IS service provision and that users were happy:

We tried to put in place a model where you couldn't see boundaries between the service provider and ourselves … They don't know who is providing the service – we want it to be seamless because we had this horrible outsourcing bogeyman … people don't like the concept of outsourcing because it threatened a lot of

people's jobs when it was running at full steam. Most people out there in user land don't really understand the benefits that can be achieved out of outsourcing if it is done right because we can keep our costs down, we can push an awful lot of process into somebody else's lap.

The Section Head believed that the aims of the process had been met, stating that 'By and large what we have is what we expected'.

All interviewees agreed that given the same set of factors, they would have made the same selection decision again, as the Section Head remarked, 'We couldn't have run it any fairer and I think we made all the right decisions'. The Consultant added that 'In the absence of any other alternative courses of action, if I've got to choose between the six, I think I'd say yes, we'd have to make the same decision'. The CIO acknowledged that the relationship with the vendor changes with the pressure of competing demands, but even with this relationship change he was inclined to extend the existing arrangement at the next review:

On contract signing the relationship will go down ... you'll never come off out of this process thinking ... that was the glory days ... everybody was everybody's friend ... you never had to push them to hold them or whatever. And the relationship does go down a bit ... they have an obligation to their shareholders to maximise their return on their business and we have an obligation to our customers to maximise the return on that contract ... so by definition there must be a pressure on both sides ... if one doesn't provide that pressure, it will go one way or the other ... that degrades a relationship over time ... but when we go back to the marketplace in two years time ... I'd lean towards keeping the current arrangement for another four years. Market testing

is expensive and everyone looks better on paper ... better the devil you know ...
and transition is quite a turmoil ... it is quite high risk for the organisation.

Overall, the organisation accepted the decision and responded well to the new vendor.

Much of this was simply because, as the Section Head remarked, 'The environment works'. The Consultant agreed, remarking that:

I am going back to this notion that people have an in-grained philosophical dissatisfaction with outsourced arrangements ... but I think people saw this as a significant improvement on what they had previously.

The investment in quality infrastructure investment has led to performance increases which led to happier users.

There appears to be a combination of key elements that led to the positive outcomes. Firstly, there were a small number of skilled decision makers. The decision makers had expertise in the problem they faced and with this came confidence. Notably, the key decision makers all had similar experience and backgrounds. Secondly, the decision makers were supported by a higher governance structure that was used as a sounding board, rather than a body that ran political interference. Thirdly, the decision makers defined clear objectives and requirements for the process. This reduced levels of uncertainty. Finally, a rational approach was applied to the evaluation, tempered with gut instinct and experience. This introduction and explicit knowledge of human factors was the most important element in the process. The evaluation team acknowledged cultural fit as being important, recognising that the decision was not just about desktops and networks, but services from people with whom they would be required to interact.

7.5 Summary

This case demonstrates that even in the most formal processes, there is potential for human bias and perception to alter decision outcomes. It also demonstrates that complex techno-rationalist decisions are justified by one group of factors, while many other factors are used by decision makers throughout the process. In this particular instance, it is clear that these can have positive effects. A summary of the factors and outcomes in relation to the contextual decision making model is depicted in Figure 7-1.

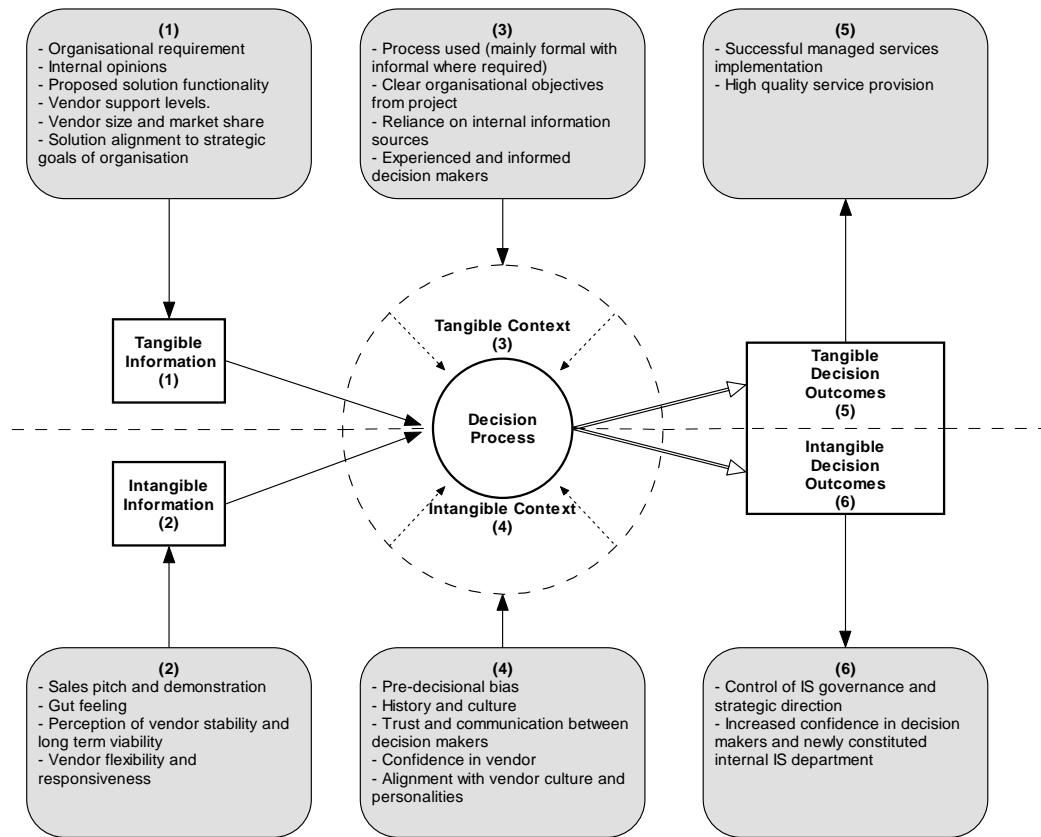


Figure 7-1 Summary of factors and outcomes within organisation D

This section briefly summarises the key elements of the case.

7.5.1 Decision making process

One of the noteworthy aspects of this case is the logical, highly scrutinised evaluation process. This led to an evaluation that was planned and extensively documented. Of all the cases examined in this thesis, this organisation's decision making procedure and

justifications were the most thorough. Two groups of factors shaped this process. The first group concerned legislative requirements and the need to follow government purchase guidelines. These dictated the practical constraints such as probity requirements. The second group of factors was the experience of the decision makers. All had prior experience with outsourcing contracts and other significant IS purchases. They were aware of the potential pitfalls and traps and guided the evaluation in such a way that they could obtain what they believed would be the best outcome for the organisation. It is the decision makers who are the key to understanding how this decision making process worked. The decision makers thoroughly understood the problem and the needs of the users. They were not led by the vendors through the process, but instead proactively provided the direction themselves. Their experience and confidence in their abilities significantly reduced levels of uncertainty surrounding the process and this affected how information was sourced and processed.

Consistent with uncertainty theory (Daft & Lengel 1990; Bartlet & Green 1966, Dudycha & Naylor 1966, Khon 1974 and Woodruff 1972, cited in Jacoby 1977), the low levels of uncertainty surrounding the decision restricted the information gathering process. This is primarily evident from the limited number of information sources, especially the external ones. When external sources were consulted, such as reference sites, these were not valued highly. During the decision, most information was sourced from internal expertise, primarily from the decision makers themselves. This contrasts with Organisation C, whose primary information sources were external and who sought outside reassurance in their final selection decision.

7.5.2 Information sources

Primarily internal information sources were used to inform the decision making. These centred on the high quality expertise of the evaluation team and their collective

knowledge. External information sources were the vendors and their nominated reference sites, although these were not regarded as important.

7.5.3 Decision justifications

In justifying the selection decision, primarily tangible factors were used. This is consistent with other cases, although it is evident that numerous other un-stated considerations were also important. Perhaps the most interesting tangible decision factor, the commercial viability of the contract, was not expressed in any form in the evaluation documents. Instead, it was represented as stability and viability of vendor. The reason for this was that there was an informal belief or understanding amongst the decision makers that the successful vendor had to make a profit. Interviewees were adamant that they did not want the cheapest vendor, or vendors they described as ‘loss leaders’. This factor was essentially contextual, as it was derived from the history of previous outsourcing contracts. In these contracts, vendors under-bid and then tried to make a profit by reducing the quality of hardware and services. It was clear that many of the decision factors were too sensitive to have been formally acknowledged without raising questions on how formal the evaluation process really was.

7.5.4 Decision factors

A combination of inter-related information and contextual factors affected the decision makers. Techno-rationalist elements were applied to broadly eliminate and rank remaining vendors. These factors included technology solution suitability, vendor viability and cost. However, subtle human factors were applied to separate the final top two bidders. These included abstract feelings and perceptions of the vendor bid teams in terms of their individual personalities and organisational cultural match. This behaviour aligns with conventional psychology theory that describes human behaviour when faced with differentiating between complex or closely weighted information (Eagly & Chaiken 1993) .

Theory indicates that when decision makers can not choose or reach a decision, they move away from hard information and use soft heuristics. By personalising the decision and involving feelings, decision makers can slightly alter perceived weightings of hard information to the extent that one option becomes the clear winner. This theme was expressed several times, however it was most strikingly evident with the CIO's comment '[on cultural/personality perception] It influences the decision ... you know, a three and a half becomes a three ... it sort of just washes that away ... we're just human beings, that's just the way it is'.

Contextually, the decision was informally framed by a number of factors and pre-decisional biases. It is clear that the decision makers entered the evaluation process with the intent of prescribing a particular outsourcing model. While it could be argued this was a requirement and not contextual issue, it defined which vendors the evaluation team thought would be able to provide the services. This was best demonstrated by the CIO's comment:

I don't think we've ever approached this with the expectation of being very surprised with the result ... If you had asked me who wouldn't be in the running, I probably couldn't tell you who was going to win, but I could probably tell you who wasn't before we even issued the tender documents.

This bias was particularly focused on the incumbent outsourcer whose service was perceived as a failure. It was clear from CIO that this vendor was never going to be considered, as he remarked 'When I came in our main priority was to get rid of the incumbent service providers ... and that was what this tender process [was about]'.

Another key contextual element was the need for a particular type of relationship. The ideal relationship was that where the department was a larger customer of a small vendor. This meant that contextual issues such as company size and country of origin became important. The relationship factor was important because of the decision makers' awareness of the department's, and other organisations' outsourcing history. This acquired experience and general awareness of the vendors, their history and their resources shaped perceptions.

7.5.5 Decision outcomes

Decision outcomes for the organisation were regarded by interviewees as excellent and there was not any data collected that would suggest otherwise. The selected vendor provided high quality infrastructure and services which led to happy and more productive users. Control was regained of IS governance and strategic direction because of the implementation of the new outsourcing model. The decision makers exited the decision making process satisfied with the process, clearly able to defend it and believing that they would take the same decision again.

7.6 Conclusion

This case has examined a seventeen million dollar outsourcing selection decision in an Australian Commonwealth government department. The department had been previously involved in an outsourcing agreement that had resulted in poor service and budget blowouts. A small team of personnel with government outsourcing experience were recruited to redevelop the outsourcing model and select a new vendor. The organisation engaged in a highly structured, formal selection process. The evaluations were score-carded and thoroughly documented. The process occurred in a small team of people with similar experience and beliefs about what type of outsourcing model and requirements the organisation required. Within the rigid shell of formality, decision making, there was evidence of many human and contextual factors that shaped the

process. Much of the success of this project stems from how the decision making occurred and how the decision makers applied their own beliefs and expertise. There appeared to be high degrees of alignment between the decision makers and there was organisational confidence in their abilities. Much can be learned from how this organisation executed this process.

Chapter 8

Cross-case analysis

8.1 *Introduction*

This chapter presents the cross-case analysis of the data collected using the methodology described in chapter three. The aim of the chapter is to address the research questions through the results of this analysis. The chapter begins by summarising and contrasting key attributes of each case examined in this research. This is followed by an analysis of each research sub-question. The main research question is then addressed, followed by a comparative literature review of findings.

Data gathering occurred sequentially in four organisations and was halted when theoretical saturation was reached. As noted by Auerbach (2005), theoretical saturation is part of the sampling process and forms a mechanism to signal when an appropriate amount of data has been collected. This method is supported by Sekaran's (2003 p. 225) opinion that:

When a sufficient number of interviews have been conducted and adequate information has been obtained to understand and describe the important factors operating in the situation, the researcher would stop the interviews.

In accordance with Eisenhardt's (1989) methodology, the completion of data gathering triggered the next phase of analysis. This phase was completed in chapters four to seven, where four case studies were presented that examined information systems (IS) decision making. This chapter presents the final phase, the detailed textual analysis, which concludes with the presentation and justification of theory.

Detailed tabulated findings can be found in Appendix C (see page 344). During the textual analysis, eight distinct groups of decision factors and justifications were identified. The groups were confidence, decision process, opinions, option attributes, organisation, perceptions, politics and vendor attributes. Fifty-nine separate decision factors and justifications were identified within these groups.

8.2 Case comparison

This section summarises and compares key attributes of each case.

8.2.1 Organisational attributes

This research examined four Australian organisations, the key attributes of which are summarised in Table 8-1. Government, education, health and utility sectors were represented in the research sample. All organisations maintained multi-site operations, with organisations C and D conducting some operations some off-shore. Full-time employment levels ranged from three hundred to in excess of fifteen hundred.

	Organisation type	Sites	Employees
Organisation A	Private electricity utility	Multi-site (12+)	300+
Organisation B	Not-for-profit health care	Multi-site (15+)	1100+
Organisation C	Public higher education	Multi-site (10+) (some off-shore)	900+
Organisation D	Commonwealth government department	Multi-site (20+) (some off-shore)	1500+

Table 8-1 Organisational attributes

8.2.2 Decision attributes

Five different decision making processes were examined in the four case studies: the key attributes of these decisions are summarised in Table 8-2.

	Decision Process	Decision makers	Decision style
Organisation A	Re-implementation of ERP reporting tool selection decision;	Hierarchal. Technical IT decision makers to high-level management	Formal/endorsement
	Infrastructure selection decision		
Organisation B	ERP (patient management & finance systems) selection	Small teams of change agents/leaders with input from multiple teams of prospective users	Formal/consultative – high organisational involvement
Organisation C	ERP selection decision	Hierarchal. Academics, IT professionals, senior executives	Formal/unstructured
Organisation D	Managed services contract	Small team of skilled senior IT experts	Highly formal/ (some consultation)

Table 8-2 Decision attributes

The decision processes concerned the selection of ERP-related technology, one hardware infrastructure and the other a managed services, or outsourcing, contract. The composition of the decision making teams and the processes used to reach decisions were closely linked. Organisation A used a small team of IS decision makers that made recommendations to managers. These recommendations went through a formal hierarchical endorsement process. Organisation B was effectively led through the decision making process by a small team of mostly highly positioned change agents. These individuals were skilled in technical, functional or high-level management operations. However, a large proportion of the organisation was consulted as part of the process and opinions from functional evaluation teams formed part of the formal assessment. Organisation C reportedly used a formal assessment gathering feedback from high-level functional evaluation teams consisting of academics and IS professionals. This feedback was then used as part of the decision making process by the senior executives. However, there is evidence to suggest that the process was less structured than this, as indicated by the lack of an obvious champion or key change

agent. Organisation D used a small team of IS experts with experience in outsourcing and the government sector. A highly structured, formalised decision making process was undertaken with some key stakeholder consultation included. It should be noted that although all organisations stated that only formal decision making processes were used, this was not consistent with other data gathered. Interviewees indicated that informal decision making processes were present in every organisation, although formal process and documentation was often retrofitted to match preferred outcomes. In the following two sections, the informational and contextual factors used in the decision making processes will be presented. Section 8.5 examines the decision justifications.

8.3 *Informational decision factors*

In order to understand how decisions were made, data was collected relating to the specific informational factors that were used by decision makers. This section reports on the cross-case findings by addressing the research question:

When making pre-implementation IS decisions, what are the tangible and intangible informational factors used by decision makers? How do these informational factors affect decision makers and decision making?

Twenty-five separate informational factors were identified as affecting IS pre-implementation decisions as detailed in Appendix D (see page 349). Appendix D provides a summary of the factors in ascending order of influence with factors having been rated as having a low (L), medium (M) or high (H) impact on the decision making. These ratings were developed by assessing the frequency and stress placed on factors by interviewees, triangulated with their presence in organisational documentation. The tangibility characteristics, tangible (T) or intangible (I) have also been assessed. Tangibility classification has been assessed primarily on the ability to quantify the factor or if decision makers indicated that it was being considered in measurable terms. In

some instances, factor tangibility was different between cases, depending on the use of score carding or the aspect of the factor that was being assessed. Factors such as opinions demonstrated tangible and intangible aspects. For example, opinions contained elements of tangible fact such as ‘they use good technology like xyz brand’ in contrast to intangible assessments, for example, ‘they seem okay’ and ‘we trust them’. Key factors and groups of factors will be examined in this section.

8.3.1 Sales pitch/demonstrations

Vendor information and sales pitch was regarded as having the highest influence on decision making. Vendor demonstrations were particularly important in organisations C and D, although for different reasons. Organisation C based a considerable amount of their limited functional analysis on vendor demonstrations, while organisation D used demonstrations as a chance to assess the human aspects of the outsourcing vendors. Demonstrations provided decision makers in organisation D with the ability to assess what they termed the ‘cultural match’. All organisations noted the risks associated with vendor sales pitch and organisations. Organisations A and B cited specific examples of negative effects from misleading information such as failed projects and poor IS investments. Even so, organisations still relied in one way or another on vendor information and direct interaction in order to reach decisions.

8.3.2 Organisational requirement

Decision makers were strongly influenced by what they regarded as indicators of organisational requirements that could be met by adopting IS. These mostly practical requirements placed pressure on decision makers to act to address perceived problems, often more rapidly than in other projects. Many interviewees used words such as ‘pain’ and ‘pressure’ to describe how they were aware of these requirements. As such, the application of this information was sometimes influenced by political organisational pressure and the time frame in which a decision was required. In these instances, for

example in organisations A and C, the organisational requirements were seen to be elevated because of a sense of urgency. In reality, although the requirements existed, their overall importance in the decision making process, especially as a motivator to ‘do something’, was unduly enhanced.

The use of this information factor in decision making legitimised and guided the definition of the requirements and criteria used to assess options. However, there was evidence that while decision making processes were guided by organisational requirements, notably in organisations A, B and D, the relationship between these requirements and selection outcomes sometimes differed. For example, in organisation A, the need for enhanced network infrastructure was met with a solution that exceeded requirements: this occurred because of direct political intervention. In contrast, organisation C chose a solution that, while delivering a comprehensive system, failed to meet the basic organisational needs. In this instance, decision making was driven by organisational need but made at an organisational level that was incompatible with having a thorough understanding of the functional requirements.

8.3.3 Internal opinions

In all but one of the organisations studied, decision makers valued and relied on internal opinions. The use of internal opinions occurred because of two, not mutually exclusive, reasons. Firstly, organisations with internal expertise relating to the decision preferred to use these resources over external consultants. This preference was a matter of trust and confidence between decision makers and information providers. Secondly, seeking internal opinions demonstrated that the decision making process was inclusive. Inclusive, consultative decision making processes were an important part of effecting change in organisation B. This process was structured to engender trust between users and decision makers and built internal confidence in the selected option.

It is notable that internal opinions had a low level of impact on the decision making in organisation C. This lack of impact was the result of two contextual factors: inexperienced or uninformed decision makers and the political effect of the composition of the decision making body. The lack of internal expertise surrounding the complex ERP decision meant that there were few internal opinions available to decision makers. Secondly, the opinions available were filtered as part of the decision making process. Opinions that aligned with the goals of key decision makers were promoted; for example, the recommendation from the evaluation group to select ERP A. However, internal opinions concerning product immaturity and anecdotes of implementation problems from other sites were not passed on.

The effect of using internal opinions in decision making was the promotion of trust and confidence between decision makers, information providers and the wider organisation. It appears that organisations that had the ability to call upon internal expertise also produced more informed decisions.

8.3.4 Gut feeling

Decision makers in all organisations, with the exception of organisation C, discussed their strong reliance on gut feeling. Perhaps this is not surprising given the complexity of the decisions that were being made. This factor supports the prevalence of heuristic use in complex decision making from findings of such authors as Eagly and Chaiken (1993), McCray, Purvis and McCray (2002), Wickham (2003) and Maqsood, Finegan and Walker (2004).

Gut feel was used to simplify and evaluate significant amounts of tangible information. Many decision-makers commented that decisions had to ‘feel right’. Eventually, even the most complex formalised evaluations were often affected by gut feelings and perceptions. The criticality of this factor was more evident when decision options were

very closely matched in functionality; for example, in organisations A and D. It was also notable that gut feeling could alter formalised decision making processes. In organisation A, business cases were reverse-engineered to match the gut feeling of key decision makers. In organisation D, the perception or gut feeling surrounding vendors altered the scoring mechanism. Interviewees explained that perceptions influenced the formal decision making processes by slightly increasing the scores or ratings of components of the preferred vendors' solutions during the evaluations.

This raises the question: why was this factor not evident in organisation C? There are a number of possible explanations but the most likely from associative evidence is that gut feeling was used, but not disclosed. Complex decision making occurred inside a poorly defined, informal framework. There is evidence that key decision makers had formed preferences (pre-decisional bias) before the evaluation began. Many decision makers absolved themselves of the decision outcomes and there was significant confusion as to how the selection decision was reached. If gut feeling was used in organisation C, why was it not acknowledged by decision makers? Evidence suggests that the reason is outcome related. Organisations A, B and D had generally good decision outcomes. Decision makers were confident and proud of the fact they could make complex decisions using their experience and perceptions. In these cases, there was no need to hide the method used to reach decisions from an independent external investigator. However, in the case of organisation C, the decision outcomes were poor. Many decision makers were defensive and went to lengths to stress the formality of a decision making process that was evidently otherwise. It would seem that although gut feel was used, it was based on poor information or experience. This concurs with an interviewee's quote from Burke and Miller's (1999) study that 'if your recollection and experiences are wrong then intuition is bad' (Burke & Miller 1999 p. 94). It should be noted that while organisations A, B and D presented evidence of gut feel being used in IS decision making, only in organisation A was evidence found that there were clear

attempts made to cover or hide this decision making factor from other parts of the organisation.

8.3.5 Functionality

Decision makers consistently acknowledged the importance of the functional match between the organisation and the decision alternatives. All organisations in some way structured their assessment around functionality. However, this factor often provided a broad screening mechanism to quickly eliminate options. Other factors, such as perceptions and opinions, were then used to differentiate between closely matched options.

A variation in the use of this factor was observed in organisation C. Although decision makers in organisation C nominally used a functional evaluation, it is clear from the lack of formal evaluation documentation that a detailed assessment did not occur. This is once again related to contextual issues such as the composition of the decision making body and the lack of internal expertise capable of performing the evaluation required.

8.3.6 External opinions

External opinions had particularly strong effects in organisations A, B and C. In organisations A and C, the information from external sources had negative or less optimal impacts on the decision making processes, while in organisation B, the effect was positive. In organisation A, an external opinion directly caused political intervention in a decision making process. This incident was a typical example of *Airline Magazine Syndrome* (Ramiller 2001) where a manager used questionable external information and over-rode the advice of internal decision makers. In organisation B, external opinions formed an integral part of the evaluation process. The use of external opinions was facilitated contextually by the nature of the not-for-profit health care sector and existing external relationships. In organisation C, external

opinions were given excessive weight in the decision making process. This was also a result of contextual factors such as the composition of the decision making body, lack of experienced or informed decision makers and organisational power structures. Notably, external opinions were used to build confidence in the selected option in organisations B and C; however with totally different outcomes.

The lack of use of external opinions in organisation D was because of contextual circumstances. The team of decision makers were all highly skilled, experienced and had been recently externally recruited to the organisation for the specific task of making the decisions. There was a belief in the organisation that within the group of decision makers there was enough knowledge and confidence to make a decision internally.

8.3.7 Other factors

The previous sections have identified the six key informational decision factors. However, there were a considerable number of other informational factors identified that affected decision makers. These factors had varied effects and impacts because of contextual elements. However, two groupings, vendor and option attributes, were clearly important. This section summarises factors by their core themes of confidence, option attributes, perceptions, politics and vendor attributes.

Confidence. Strong confidence in opinions and processes played an important role in organisations A, B and D. Decision makers acknowledged that they were cognisant of the level of confidence they perceived regarding opinions and information informing their decisions and how that information was processed. Decision makers needed to be confident they had reached a decision using reliable information through a thorough process. The implication was that decision makers would not make a decision until this confidence level had been reached. Decisions did not need to be perfect, but decision makers had to be confident that the processes they had used were good enough to

produce acceptable outcomes. This behaviour has similarities to Simon's (1967b) satisficing behaviour and reaching Seltin's (2001) aspiration level.

Option attributes. In assessing decision option attributes, the issue of alignment became one of matching the attributes of the solution and the requirements of the organisation. Issues such as how well the option was politically aligned with the beliefs of the decision makers (organisations A and C) and how well it met strategic and organisational goals (organisations B and D) became important considerations. Many decision makers considered the long-term technology adoption issues and considered solution maturity and viability. Cost, although considered in all cases, did not have a significant effect on decision making. Although there are a number of possibilities as to why cost was not deemed important, one explanation is that budgets were not tightly defined before the evaluation processes began. A second possibility, supported by evidence of pre-decisional bias, is that decision makers knew the costs of their preferred solutions before evaluations began. Organisations were often aware of expected costs and did not equate the cheapest solutions with the best solutions for the organisations. Notably, organisation D intentionally avoided the lowest bidder to ensure the vendor's solution was commercially viable.

Perceptions. Perceptions, such as 'gut feel' discussed in section 8.3.4 (see page 256), played a considerable role in decision making. One aspect of these perceptions was a 'feeling' if a decision option was 'suitable'; if it would fit with the organisation. This perception of fit was a mix of factors that partially encompassed elements of other informational factors such as organisational and political fit. The key to the factor was the degree of alignment between the functional and tangible aspects of a solution match with the intangible human interaction elements.

Politics. Politics had two direct informational influences. In cases A and C, decision options were only promoted through the decision making structures if they were politically viable. Options that were unlikely to be accepted were screened out by information providers and decision makers at lower levels of the organisations. There were contextual reasons for this behaviour that related to building or maintaining organisational confidence in IS departments within organisations. Direct political intervention was also observed in organisation A resulting in decision making being removed from the IS decision makers and taken at a senior management level.

Vendor attributes. Most decision makers took a long-term view of their IS decision making and considered how they would interact with the vendor after the system or service was provisioned. Issues such as support levels, the location of the vendor support and vendor viability and stability were often considered. In directly evaluating the vendor, the vendor's market share, flexibility and willingness to negotiate were important considerations. Vendors with an existing presence and technology in organisations had advantages over those that did not. Vendor reference sites were regarded with caution and suspicion and were perceived to be biased information. Much of the vendor assessment centred on the potential for relationship building and how well the vendor aligned with the needs of the organisation.

8.3.8 Factor tangibility

A final consideration in the examination of the information used by decision makers was the tangibility characteristics of the factors. Six of the twenty-five informational factors were classed as intangible, while fourteen were classified as tangible. Five of the factors exhibited both tangible and intangible characteristics within or between cases. However, it is clear that while the majority of informational factors were tangible, the most influential in the decision making were intangible or had intangible characteristics.

8.4 Contextual decision factors

Contextual factors shaped the way in which information was used and how decisions were made. This section reports the cross-case findings by examining the research question:

When making pre-implementation IS decisions, what tangible and intangible contextual factors affect decision makers? How do these contextual factors affect decision makers and decision making?

Thirty-one separate contextual factors were identified as affecting IS pre-implementation decisions as detailed in Appendix E (see page 352). It should be noted that although separate, many factors were interconnected or acted in concert. Appendix E provides a summary of the factors in ascending order of influence with factors having been rated as having a low (L), medium (M) or high (H) impact on the decision making. These ratings were developed by assessing the frequency and stress placed on factors by interviewees triangulated with their presence in organisational documentation. The tangibility characteristics, tangible (T) or intangible (I) have also been assessed using the same method applied to informational factors (see page 254). Key factors and groups of factors are examined in the following sections.

8.4.1 Pre-decisional bias

Pre-decisional bias was consistently present in all cases examined. Decision makers entered evaluation processes with pre-conceived views and beliefs and most noted that they were able to predict or engineer selection decisions. Pre-decisional bias worked to constrain selection processes and screen decision options. Bias also contributed as gut-feeling information in the decision making processes.

Some decision makers were overt in their use of pre-decisional bias; for example, in organisation B, the Group EO (Business) had experience with Product A and used this to influence other decision makers. In organisation D, the pre-decisional bias was the implicit need to remove the incumbent service provider. As such, the incumbent vendor's proposal was never seriously considered. Organisation C exhibited evidence of pre-decisional bias through the behaviour of one of the key decision makers.

Interviewees reported that the IS executive had been active in promoting his preference, ERP A, before the RFP or evaluation processes. Interviewees described how the IS Executive even distributed demonstration copies of the ERP well before the organisation had even agreed to consider replacing the existing systems.

The effect of pre-decisional bias as a contextual factor cannot be underestimated in IS decision making as it shapes the evaluation. It is evident that decision makers in organisations A, B and C had clearly preferred products, while those in organisation D knew which options were automatically eliminated. As such, much of the evaluation and selection criteria were designed around reaching or moving the organisations toward those outcomes.

8.4.2 History and culture

Of all the contextual elements to emerge from this study, organisational history and culture was the most subtle and complex and had the most far reaching effects and interactions with other factors. Each organisation had a complex history and set of established norms and beliefs. This history and culture had both positive and negative impacts on decision making and outcomes.

Organisational history dictated how organisations viewed both IS departments and IS innovations. This in turn affected how decisions were made and who was involved in decision making. Organisations that had positive prior experiences with their IS

departments were content to have processes led by decision makers from within these units. Organisations with negative experiences removed control from the IS departments and controlled decisions at higher levels. Organisations B and D fell into the former category; organisation C, and to a lesser extent, A, fell into the latter category. Observable outcomes from this behaviour were that organisations with a positive perception of IS and their IS departments were able to reach more informed decisions without the need for ‘game playing’ and politics.

Evidence from the case studies suggests that there are strong relationships between elements of organisational history and trust that create an ever evolving environment. For example, one failed project or a project that leads to negative outcomes can alter the perception of trust and confidence and cause a change in the way subsequent decisions occur. This was particularly evident in organisation A where IS decision makers were aware that a single failure would damage their reputation and potentially remove later decision making power. Organisation C, which had a history of less than favourable IS project outcomes, had little confidence in its IS department. As such, the IS department was virtually removed from any significant role in the ERP decision making process.

Organisational culture was also particularly important in defining the decision makers and process. This was most evident in organisation B where the ‘care’ culture dictated that a consultative decision making process was used. This process gave decision makers and other members of the organisation confidence and reassurance. It reduced uncertainty and created an environment for change. In contrast, organisation A had a combative and competitive culture. Strong business unit silos were evident and the IS department was seen as a cost centre that had to prove its worth. Decision making became a process of ‘proving’ a case; because of this, much of the decision making became a political exercise.

Other cultural elements included cost-culture and IS strategic beliefs. Cost culture and the ability to develop business cases for IS projects were evident in organisations A, B and D. However, organisation C lacked a cost-culture, so projects began without clear objectives and justifications. This was noted as having negative impacts on decision outcomes. IS strategic beliefs defined the direction that organisations, and in particular the IS departments, believed the organisation should progress with technology in order to meet organisational requirements. These beliefs ranged from preferences in self-service models of reporting to minimal development in-house and purchasing off-the-shelf solutions. These beliefs often led to pre-decisional bias in decision makers and constrained or defined decision options and evaluation criteria.

8.4.3 Informal or formal decision making process

One of the most curious observations from this research concerned the effects of process style on decision makers and outcomes. All organisations stated that they were using formal, structured decision making, however there was also clear evidence of informal decision making occurring in each case. These two styles were used at different times and for different reasons.

Informal decision making occurred when a number of other contextual factors were present. A condition for positive outcomes from this factor was that the decision making team were skilled, confident, understood the problem and communicated well. It was critical that core decision makers could be honest about what motivated their decision making and that political factors were absent. This was exemplified by decision making in organisations B, D and *within* the IS department of organisation A. Trust was a key issue if informal decision making was to be applied successfully.

However, informal decision making was negatively affected by political organisational pressure and the time frame specified in which to reach a decision or complete the

project. In these instances, quick, sometimes ill-considered decision making occurred. It is notable that this occurred in organisations A, and to a greater extent, C. A lack of internal expertise or experience in decision makers was also a precursor to negative effects from this factor, as in Organisation C.

Formal decision making provided the structure and framework for the evaluation process. It provided a formal screening and justification mechanism that decision makers could assess information with. The more clearly defined the structure, the greater the confidence of the decision makers in the decision outcomes. Organisational history and culture dictated how decisions were made, and organisations A, B and D had defined formal procedures. Although there was evidence of elements of formalised processes in organisation C, these were not connected and were ultimately ineffective given the final decision making was informal. Formal decision making also promoted organisational confidence in decisions which had positive effects on decision outcomes.

However, formal processes were subject to abuse. As noted in section 8.3.4 (see page 256), processes could be re-engineered to match desired outcomes. Even formalised score-carded processes could be altered, as in organisation D, as part of the evaluation. While this seems to be an application of gut feeling, there were strong political reasons for this behaviour in organisation A. Given the siloed, combative nature of the organisation, the IS department had to be seen to be following formalised processes in order to be resourced and trusted. This ‘game playing’ by the IS department wasted resources and time and did not add value to decision outcomes.

8.4.4 Other factors

The previous sections have identified the three contextual decision factors. However, many of the other contextual factors identified are intrinsically related to the main

elements already discussed. This section summarises them under their core themes of confidence, decision process, organisation, politics and vendor attributes.

Confidence. Trust and confidence, as well as good communication between decision makers has already been noted as underpinning the decision making processes. These factors allowed decision makers to openly acknowledge what information, both tangible and intangible, was important in their decision making. This allowed for open debate and rational evaluation. When decision makers lacked these elements, decision transparency decreased and the effects of politics, private bias and personal agendas became more obvious. This was notable in organisation C in particular, however was also observed within organisation A. Although there was clearly trust within the IS department, once the decision was elevated to the steering committee, the representative of the IS department had to engage in political games. In this instance, the IS department was constantly second-guessing the steering committee and promoted only politically viable options, believing that if an option was ever rejected, the department would lose credibility.

This introduces the broader issue of organisational trust in IS decision makers and IS departments. Evidence from this research has indicated that IS project failure erodes confidence in IS decision makers and IS departments. This negatively impacts on decision making in two ways. Firstly, as previously discussed, decision making and the ability to provide significant input may be removed from IS departments. Secondly, IS decision makers become aware that there is low organisational confidence in their abilities. In order to counter this, they self-censor decision options, promoting what they believe are organisationally acceptable, low risk and politically viable solutions. Therefore, decision making becomes an act of politics rather than seeking out the best solution for the organisation. Conversely, decision makers with a history of IS project success are given more control over process and appear to place more emphasis on what

is best for the organisation rather what is more politically viable. It is evident that trust, both internally between decision makers, and externally, between decision makers and the wider organisation has a significant contextual effect on decision making. This forms one element of a broader theme of alignment between elements of the organisation.

Decision process. Apart from the use of informal and formal decision making processes as discussed in section 8.4.3 (see page 265), other decision process factors affect decisions. These factors fall into two broad groups: where information is sourced from and the experience of decision makers. Decision making processes relied on quality information to produce positive decision outcomes. Internal information sources had marginally higher influence on decision makers than external sources, except in organisation C. Organisation C relied heavily on external information sources from the vendor, and opinions from other institutions. This was seen as having a negative effect, particularly the heavy reliance on vendor sources. However, possessing and using internal information sources was seen as having positive effects in other organisations. Decision maker experience and knowledge of the problem area was a critical factor in achieving good decision outcomes. Inexperienced decision makers failed to gather all the information they required or explore all alternatives. They also placed undue emphasis on some factors, while virtually ignoring others: this was particularly evident in organisation C.

Organisation. Apart from the strong effects of organisational history and culture, three other important organisational phenomena were evident in the cases. Firstly, organisations established time frames in which decisions had to be made or by when IS projects had to be completed. This meant that delivery dates or expected project completion times became part of the decision making process. As previously discussed, this factor also pressured decision makers to make decisions quickly.

Secondly, clear organisational project objectives meant that evaluation processes could be well defined. Once the expectations from the IS projects were established, decision makers were more confident in their decision making processes and selections. Unclear objectives produced negative outcomes. This was clearly evident in organisation C where decision makers lacked direction and the priorities for the ERP adoption differed between stakeholders. Apart from the selection decision, this factor affected pre-implementation decisions concerning the order in which functionality was implemented. Many interviewees from organisation C believed that the lack of clear objectives meant that critical functionality was delayed, causing poor system acceptance.

Finally, an organisation's external relationships played an important role in some cases. Organisations that had reliable external relationships were able to access high quality information, thus assisting in the decision making process. This was particularly observable in organisation B which used its contacts in other not-for-profit health care providers to feed information into, and assist, the evaluation process.

Politics. Political contextual factors were consistently present in organisations where the decision making processes lacked transparency and rationality. Politics affected how fast a decision was made, the way in which it was made, what information was considered, who made the decision and what weight each decision maker's opinion carried. The overall effect of politics in IS decision making was observably negative because of its tendency to alter focus on what was best for the organisation to what was best for individuals or departments.

Political factors emerged when there were low levels of internal IS strategic alignment between the IS department and the remainder of the organisation. IS strategic alignment is the degree to which an organisation is able to take advantage of IS in order to meet

business objectives. More formally, it is a combination of intellectual and social conditions where business IT and business plans exist and IT and the degree to which business executives are committed to and understand the plans (Reich & Benbasat 2000). Reich and Benbasat (2000) stated that alignment is facilitated by five organisational attributes:

1. Shared domain knowledge between business and IT executives
2. IT implementation success
3. Communication between business and IT executives
4. Connections between business and IT planning processes
5. Strategic business plans

It is notable that the first four attributes have already been identified as contextually important factors in IS decision making in this research, while organisational planning culture is a subset of the fifth.

Politics became an obstacle to efficient transparent decision making. It enabled decision makers to exercise bias in order to follow their own agendas and interests. Politicised structures meant junior decision makers with high quality information or skills were not always heard. Politics led to ‘game playing’ and deception between different parts of the organisation. This factor had no observable positive effects.

Vendor attributes. Vendor relationships and confidence in vendors were important factors in many organisations. Existing vendor relationships established a form of pre-decisional bias. For example, decision makers used the quality of their existing relationship to weigh in favour of, or in the case of organisation D, against, the incumbent. Organisations with positive existing vendor relationships were more likely to choose that vendor again. Vendor alignment was also identified as having some

importance. Vendors whose culture and personalities were similar to those in the evaluating organisation were more positively perceived. This forms part of a general trend towards the importance of alignment.

8.4.5 Factor tangibility

A final consideration in the examination of the contextual elements that influenced decision makers was the tangibility characteristics of the factors. Fifteen of the contextual factors were classed as intangible, while fourteen were classified as tangible. Two factors exhibited both tangible and intangible characteristics within or between cases. Although the two most influential contextual factors were intangible, there was approximately the same number and spread of influence between factor types. Therefore, no conclusive relationships could be drawn between factor tangibility and influence in contextual factors.

8.5 Factor disclosure

As discussed in chapter two, section 2.5.3 (see page 58), not all causal reasons for decisions are always disclosed. As part of this investigation, the factors that decision makers nominated as affecting their decisions were compared against those that were provided as the formal justifications. This section reports on the cross-case findings by examining the research question:

Are all decision making factors formally disclosed in decision justifications?

If factors are not formally disclosed in justifications, what are their characteristics? Are there relationships between factor tangibility and disclosure? Do undisclosed factors have a greater influence on decision makers than disclosed factors?

Eighteen separate IS pre-implementation decision justifications are detailed in Appendix F (see page 355). Three of these factors, alternative option flaws, vendor experience, and need for business process re-engineering (BPR) were not nominated as decision factors. Factors have been rated as having a low (L), medium (M) or high (H) importance as justifications. These ratings were developed by assessing the frequency and stress placed on factors by interviewees triangulated with their presence in written justifications. The tangibility characteristics, tangible (T) or intangible (I) have also been assessed using the same method applied to informational and contextual factors (see page 254).

8.5.1 Disclosed factors

As is evident from Appendix F, only fifteen of a possible fifty-six decision factors were nominated as decision justifications. An additional three factors, which were not reported as having affected IS pre-implementation decision making processes, were also nominated as justifications. Therefore, it is clear that a majority of decision factors in IS pre-implementation decision making are not disclosed. This section discusses some of the characteristics of the justifications and discusses issues relating to their use.

8.5.1.1 Justification characteristics

Of the nine key informational and contextual decision factors detailed so far (see Appendix G, page 357) only two appeared in decision justifications. In other words, seven of the key factors that influenced decision makers were not recorded in the justifications. The remaining factors, organisational requirement and functionality (software and hardware features), formed the two most important justifications. All but four of the justifications were informational factors. Contextual factors were key decision factors yet have not translated into decision justifications. The contextual factors used concerned vendor relationships and confidence in the vendor, a need for BPR and a lack of organisational confidence in the IS department.

Vendor relationships and confidence were notable decision factors and their inclusion in justifications indicates a transparency in the decision making processes in organisations B and D. The remaining contextual justifications were used in organisation C only. The use of the need for BPR as a justification seems inconsistent with any of the other factors that informed or affected the decision. However, the lack of organisational confidence and trust in the IS department was supported by other decision factors. This factor related to the organisational belief that the IS department would be incapable of building their own information system in-house or should have involvement in the decision making process.

8.5.1.2 Justification tangibility

Ten of the eighteen justifications demonstrated tangible characteristics. Although only just over half of the justifications used were tangible, those factors that were consistent across studies and had the most importance were tangible. The notable exceptions were vendor confidence or trust and existing vendor relationships. Although these factors were important justifications in some organisations, they were not present across all cases. It should also be noted that these factors also have some tangible characteristics.

Of the tangible factors, organisational requirement and functionality (software and hardware features) were consistently the most important tangible justifications provided across cases. These factors have also been identified as key factors across cases (see section 8.3.2, page 254 and section 8.3.5, page 258). Although there is evidence that tangible justifications are more important and used more consistently than intangible factors, the near even split of factors means that no significant links between explicit factor disclosure and tangibility can be drawn from this study. However, these findings are consistent with the literature in that important justifications exhibit measurability characteristics (Heracleous & Barrett 2001; Myers 1994a; Myers 1994b; Myers &

Young 1997; Ramiller 2001). It should also be noted that the use of intangible justifications appears contextual, as organisations B and D appeared more willing to disclose the use of these factors. This is consistent with earlier findings that the decision making processes in organisations B and D were more transparent.

8.5.2 Undisclosed factors

Forty-one additional decision factors were not disclosed in decision justifications. These consisted of twenty-eight contextual and thirteen informational factors, a summary of which can be found in Appendix H (see page 359). Although the majority of the factors were contextual, three of the top five of the most influential were informational. These included the most influential key informational decision factor, vendor sales pitch or demonstrations. It is evident that most undisclosed factors were contextual; however some of the most influential were informational.

The evidence of significant use of undisclosed factors is consistent with the indications from the literature that causal factors are not always explicitly acknowledged in decision justifications (see for example Davis et al. (1992), Myers (1994a; 1994b), Ramiller (2001) and Heracleous & Barrett (2001)). However, as discussed in section 8.5.2.2, the level of influence of the undisclosed factors was more significant than expected. This section discusses some of the characteristics of the undisclosed factors found in this study.

8.5.2.1 Disclosure and tangibility

Fourteen of the undisclosed factors were classified as intangible, while twenty-one were tangible. Six factors exhibited both tangible and intangible characteristics within or between cases. Clearly a majority of undisclosed factors were tangible; however it is noteworthy that the three of the top four key decision factors were also in the top three most influential intangible undisclosed factors (see Appendix G, page 357). This trend

is present in the broader analysis of the data and findings indicate that the more influential undisclosed factors tended to be intangible or have intangible characteristics.

8.5.2.2 Disclosure and influence

From the key decision factors detailed in section 8.3 (see page 253) and section 8.4 (see page 262), it is evident that the most influential decision factors remained undisclosed in decision justifications. The two key factors that were disclosed, functionality (software and hardware features) and organisational requirement were tangible. Undisclosed key decision factors were mainly intangible or had intangible characteristics.

From these findings, it is evident is that IS pre-implementation decision making was not being justified in a transparent fashion. As posited in chapter two, section 2.5.3 (see page 58), decision makers were making decisions based on one set of factors while justifying their behaviour using other methods. These justifications were often also decision factors; however they were not decision critical elements. As such, it is clear that undisclosed factors, which are more likely to have intangible characteristics, have more influence on decision makers than disclosed factors.

8.6 Factor relationships

The a priori basis for this research was that relationships exist between IS project pre-implementation decisions and organisational outcomes. This study has examined these relationships and investigated links between decision factors and outcomes. This section reports the cross-case findings of this investigation by addressing the research question:

What relationships exist between the decisions made in the pre-implementation phase of an IS project and the organisational outcomes? Are there relationships between decision factors and decision outcomes?

This section begins by addressing the issue of relationships between pre-implementation decisions and organisational outcomes. It then details relationships between decision factors and decision outcomes.

8.6.1 Organisational outcomes

The a priori argument for this research was that there were relationships between poor IS pre-implementation decisions and negative organisational outcomes. Conversely, it was argued that good pre-implementation decisions lead to positive organisational outcomes. Throughout this research, there have been several examples of pre-implementation decisions that have had direct links to organisational outcomes. Some of these decisions related directly to the specific implementations under investigation, while others were provided as part of the organisational history. From these examples, the a priori argument has been emphatically supported in this thesis.

Organisations A, B and D provided historical examples of pre-implementation decisions that had led to negative outcomes. These decisions concerned specification and selection issues, as described in Table 2-7 (see page 65). Interviewees noted that the selection of products that did not ‘fit’ with the organisation led to failure. Many went on to nominate specific decision factors that could be directly traced to the decision outcomes. Notably, organisations A and B nominated sales pitch or demonstrations as having negative effects on decision outcomes. Interviewees from organisation B also nominated direct political interference as having negative effects, exemplified by having products selected outside the IS department. In these instances, products often did not match the organisational requirements and caused implementation failures or post-implementation support problems. Interviewees in organisation D gave examples of poorly selected outsourcing methodologies that failed to be flexible or meet the needs of the users. They emphasised the separation between the methodology (planning) and the selection of the vendor to meet the contractual needs. In the view of interviewees from

organisation D, the pre-implementation decisions surrounding the selection of the outsourcing model caused negative outcomes, not the outsourcing provider. This was once again regarded as an issue of alignment between the organisational needs, the selection criteria and what services the vendor provided.

In the implementations directly observed, there were strong links between pre-implementation decisions and organisational outcomes. Organisations B and D reported positive outcomes from decisions made in the pre-implementation phase. Organisation A had mixed outcomes, and organisation C had mainly negative outcomes. The factor-outcome linkages will be explored in the following sections; however there were a number of critical decisions in each that could observably be related to organisational outcomes. The following are examples of decisions and organisational outcomes from each organisation.

Organisation A. Organisation A's network infrastructure pre-implementation decision making style had positive effects on organisational outcomes. The decision to involve users closely in the selection process created the consultative environment that meant users engaged in the change process and took ownership of the new technology. By assessing the users' requirements, rather than specifying perceived needs, there was greater alignment between the product functionality and the organisational requirement. However, it should be noted that the selection decision was altered in this case by the site General Manager and his decision to intervene could have had negative consequences given his reliance on informal external opinions. Organisation A's initial data warehousing tool selection proved to have poor organisational outcomes. This decision was taken by management as part of a wider ERP selection and lacked IS department involvement. The decisions surrounding planning for its implementation were poor and ill-informed, thus the re-implementation project was required. This was organisationally negative because resources had been wasted and users had been unable

to obtain data from the ERP system, leading to inefficiencies in operations. However, during the re-implementation, the decision to apply informal decision making processes and act quickly to start the project meant that the organisation's reporting problems were addressed faster than expected. However, the processes employed and the internal outcomes were arguably less positive, as decisions such as retrofitting the business case contributed to the lack of transparency. The processes also indicated that there was a gap between the operations of the IS department and other business units, suggesting poor IS strategic alignment.

Organisation B. Organisation B's decision to use a consultative decision making approach removed much of the uncertainty and concern from users. This created an environment that ensured the implementation project had the maximum level of cooperation from the broader organisation. The decision to use external advice from members of other not-for-profit health care facilities created a pool of well informed advisors that assisted in completing a thorough evaluation. The decision to use a skilled external project manager to guide the process had particularly positive effects, as the organisation recognised that internal resources were not sufficient. Finally, the decision to focus on vendor support issues as key evaluation criteria demonstrated considerable forethought. This focus ensured that the vendor would provide implementation and post-implementation assistance to contracted support levels.

Organisation C. Organisation C made many poor decisions during the pre-implementation phase of the ERP project that had negative organisational outcomes. Arguably the most flawed decision was the timing of the implementation. The immaturity of the student records modules in all of the ERPs evaluated was a warning that an implementation could be riskier than normal. In such circumstances, it is prudent to wait for better resourced and skilled early implementers to establish paths to successful implementations. Such implementers are usually large institutions with high

levels of vendor support onsite. The effect of implementing early was that the organisation met with many technological problems, both hardware and software, that caused time and budget to increase. The decision to modify the ERP and introduce local customisations had the most negative long-term organisational consequences. Apart from adding to an already large project, the customisations complicated patch application. This issue was particularly critical because the product was immature and the vendor was releasing large numbers of patches to fix bugs and broken functionality. However, the decision to extensively customise the ERP meant that each time a patch was applied, the customisations had to be reapplied. This was a complicated task and drained resources from the implementation project, placing pressure on budget and time. In the longer term from a post-implementation perspective, the decision to extensively customise led to high support costs and the inability to patch, resulting in vendor support problems.

Organisation D. Organisation D made one key decision that led to positive outcomes. The decision makers developed an outsourcing model that met the needs of the organisation prior to seeking specific vendor solutions. This exercise in clearly setting the goals and requirements gave the decision makers control and confidence in the evaluation process. The result of this decision was an informed selection of a vendor who matched the organisational needs. The operational and organisational outcomes from the selection were widely endorsed as positive.

From these examples, it is clear that pre-implementation decisions have direct effects on organisational outcomes, both positive and negative.

8.6.2 Positive outcome relationships

Appendix I (see page 363) lists factors that were found to have had only positive effects in at least two cases. Although other factors, such as organisational history and culture

and pre-decisional bias had positive effects in some circumstances, their effects were contextually linked to other factors; thus cannot be clearly identified as positive-only.

Single causal factor-outcome relationships were difficult to establish and were not the intention of the study. However, a number of factors in concert clearly contributed to positive outcomes. Many factors also had indirect relationships with outcomes.

Although individual factors are reported in this section, it should be noted that these should be considered in the context of their broader thematic groupings. Three factors were found to have had effects across three organisations (organisations A, B and D) with positive or mainly positive outcomes: *clear organisational objectives, trust and good communication between decision makers and confidence in options and process*.

Clear organisational objectives. Clear objectives for the IS project were essential for informing and reaching good selection decisions. As a result of using this factor to inform decisions, decision makers chose systems that more closely matched the needs and requirements of their organisations. This factor had a greater effect if there was IS strategic alignment within the organisation. Having clear organisational objectives also contributed to more structured and transparent decision making processes and when not present, such as in organisation C, the converse factor, lack of organisational objectives, was noted as having serious negative outcomes.

Trust and good communication between decision makers. Trust and communication between decision makers was important in being able to quickly reach decisions. Decision makers who could communicate well and trusted each other were able to formulate open evaluation criteria that removed the need for deceptive political ‘game playing’. Positive decision outcomes from this factor were notable in organisation B where the factor facilitated a consensus change culture. This culture helped the organisation embrace both the need for change and the new technology. Trust and good communication in Organisation D’s small team of experts meant that they were able to

be honest about what factors were important to them, avoiding ‘game playing’ and conducted open debate. The decision outcomes, and organisational effects, were a rigorous evaluation process that led to an informed, well accepted and successful solution. The effect of trust and good communication in organisation A was being able to devolve decision making to lower levels of the IS department. The IS Manager trusted his staff to reach decisions quickly, only communicating the solutions and core decision justifications to him for his endorsement. While this worked well internally, this trust and good communication did not extend beyond the IS department. However, as a result of the good communication between decision makers, the decision was reached rapidly and the project started quickly. In doing so, it addressed the organisational reporting requirements in a shorter time frame.

Confidence in options and process. Confidence was a critical factor that affected the way in which decision makers reached conclusions. Without confidence in options and process, decision makers indicated that they would not make a decision. This provided a mechanism of quality control whereby even if an option met the theoretical needs of the organisation, it would not be promoted or endorsed until decision makers had a degree of confidence in it. This confidence was informed by a broader range of factors, and the outcome was that only options that were fully supported were selected. These outcomes were then fully supported and championed by the decision makers after the selection processes.

8.6.2.1 Other factors

The remaining factors were, with the exception of the use of formal process and use of internal opinions, evidenced in only Organisations B and D. The factors derive from the themes of confidence, decision process, opinions, option attributes, organisation attributes, perceptions and vendor attributes.

Confidence. Confidence formed a consistent theme in achieving positive outcomes. It has been noted that trust between decision makers and confidence in options and process was important in achieving good outcomes. However, to achieve positive results, there also had to be trust between IS departments and other business units. Without this trust, there is evidence that decision making became a political game. Organisations that evidenced trust as part of their decision making, such as organisations B and D, were able to make significant decisions within the IS departments. Trust, in combination with IS strategic alignment, created an environment that had technically informed decision makers who also were cognisant of the needs and goals of the organisations. The decision outcomes were systems and solutions that strategically matched the organisations' needs.

Decision process. Decision process factors contributed to building decision credibility and informing better decision making. The use of formal decision making processes was noted as having good outcomes in organisations A and D. Both organisations applied strong formal processes in order to demonstrate transparency, giving members of the organisation and external participants confidence in the processes. This was an important decision outcome as it built organisational confidence in decisions and in the decision makers. However, it should be noted that although interviewees from organisation A stated that formal processes were used, there was evidence that some of these were being retrofitted to existing decisions. It was also apparent that having experienced decision makers led to good decision outcome effects in organisations B and D. Outcomes included more informed decisions that resulted in both organisational confidence and good solution selections.

Opinions. Using and relying on internal opinions contributed towards positive decision outcomes. Decisions made based on internal opinions were more closely aligned with organisational needs and were less subject to conflicting external agendas. The use of

internal opinions also strengthened the confidence in the decision and contributed to better selection decisions. This was particularly evident in organisation D where high levels of internal expertise were critical in developing appropriate evaluation criteria and having the ability to assess vendor proposals. As such, it should be noted that the strength of this attribute was moderated by the levels of internal expertise.

Option attributes. The option attribute, organisational or strategic alignment, was an important predictor of decision outcomes. Consideration of this factor led to selection decisions of solutions whose attributes aligned with the needs and goals of the organisations. The implementation of such solutions had observably positive outcomes, particularly in organisations B and D which actively considered how well vendors could assist in reaching organisation strategic goals. In both decisions, broader issues of organisational alignment played a role in how well the solutions were accepted in the long-term.

Organisation attributes. The existence of reliable external relationships had a positive effect on decision making and decision outcomes. Organisations that were able to use reliable, informed external sources were able to make better decisions. This factor was an indicator that a thorough evaluation of all options was possible and tended to indicate that selection decisions would have positive organisational outcomes. Organisation B exemplified this by leveraging off its contacts and networks in the not-for-profit health care sector in order to gather additional information and expertise. Note that the reliability of the external organisation is the key to this factor. The use of an unreliable source, such as organisation C's high-level discussions with an external reference site, can have the opposite effect.

Perceptions. The perception of alignment, fit and suitability by decision makers was associated with good outcomes. This intangible perception was closely related to the

tangible option attribute of organisational or strategic alignment and could also be described as a gut-feel alignment assessment. However, the perception of suitability encompassed a broader range of ‘soft’ human assessments in combination with technical data. Decision makers in organisations with good outcomes made judgement calls on the broader match between the technical and cultural needs of the organisation and the solutions provided by vendors. These considerations led to selection decisions whereby vendor socio-technical attributes were well aligned with the organisations’ requirements. Directly observable outcomes ranged from successful implementations to good vendor support post-implementation. Both organisations B and D reported that their selection decisions had to be perceived as suitable, both by the decision makers and the wider organisations, and those perceptions of suitability and alignment were critical for user acceptance.

Vendor attributes. Vendor confidence and trust meshed with other factors such as alignment and related to the general themes of both vendor attributes and confidence. Organisations that had established or felt trust in vendors were more likely to choose them again. The trust relationships built a degree of confidence into the decision making and this factor was a good predictor of continued good outcomes. This was especially notable in organisation B as the established vendor relationship was a significant predictor of the levels of service and support after the selection and implementation of the new system.

8.6.3 Negative outcomes

Appendix J (see page 365) lists factors that were found to have had only negative effects in at least two cases. Single causal factor-outcome relationships were difficult to establish and were not the intent of the study. However, factors that had negative effects were more observable. A number of factors in concert contributed to negative outcomes and many factors also had indirect relationships with outcomes. Most factors associated

with negative outcomes should be considered in the context of their broader thematic groupings.

The factor that elicited the strongest clear negative outcomes over three organisations was vendor sales pitch or demonstrations. This factor was acknowledged by interviewees as having negative effects on decision making, leading to poor selection decisions and systems that were organisationally misaligned. Over reliance on sales pitch and demonstrations led to poorly informed decision making and numerous historical examples of negative outcomes were provided by interviewees in organisations A and B. Organisation C clearly relied almost entirely on vendor demonstrations for its high-level functional assessment: this assessment was flawed and contributed to the poor selection decision.

8.6.3.1 Other factors

The remaining factors were notably only present in organisations A and C. These factors fall under the themes of confidence, decision process, opinions, option attributes and politics.

Confidence. As noted previously, confidence and trust between the IS department and the rest of the business was a contributing factor to positive decision outcomes.

Conversely, a lack of confidence altered the decision making and the way information was assessed. In organisations that lacked confidence in their IS departments, decisions were taken outside these units, usually at higher levels of the organisation. While these decision makers were aware of the strategic aims of the organisation, they were often unaware of the necessary factors that required consideration in technology decisions.

This was exemplified in organisation A, where decision makers purchased a data warehousing tool without IS department involvement. While the organisation strategically needed the tool as part of its overall need for quality and timely information

delivery, the technology decision was poor and created an ongoing support problem. It is also notable in organisation A that the lack of confidence meant that the IS department had to waste resources and time retrofitting decisions with business cases that match the expectations of other business units. The behaviour led to a lack of transparency as to why decisions were taken.

Decision process. Decision process factors had significant effects on decision outcomes. For example, in organisation C, a reliance on vendor information narrowed information gathering and led to less informed decisions resulting in poor organisational outcomes. However, this was a mistake that experienced and informed decision makers were unlikely to make. As evidenced by the data warehousing example in organisation A, decision makers lacking appropriate knowledge made poor selections. However, inexperienced and uninformed decision makers also made many other poor pre-implementation decisions leading to negative decision outcomes. As exemplified by organisation C, decision makers who were unfamiliar with functional attributes, best implementation practices and organisational effects of specific technologies made poor pre-implementation decision that led to short and long-term negative organisational outcomes. In organisation C, it was clear that decision makers were not even aware how much an ERP would cost to purchase, let alone implement. As such, they were subject to Duhaime and Schwenk's (1985) fallacious *reasoning by analogy* bias whereby they equated the decision with a much smaller software purchase. This lack of experience affected decisions relating to how the product was evaluated, who made the decisions, what information was gathered and even critical implementation mistakes such as extensive customisation.

Opinions. In what might seem a contradiction to the relationship between organisational external relationships and positive decision outcomes, the use of, and reliance on external opinions was also observed to produce negative outcomes. In

organisation A, the use of external opinions by the General Manager to inform his decision to over-ride the advice of his IS department set a bad precedent. Although the users were happy with the solution, the reliance and the application of undue weight to external opinions had the potential for a poor selection decision. At an organisational level, the selection meant the use of a more expensive product with capabilities beyond requirements. The use of the external opinions was not documented and resulted in a decision making process lacking in transparency. Organisation C also relied heavily on external opinions and these were also sought by senior levels of management. External opinions from senior executives at external organisations were used to build comfort and confidence in the preferred option. However, the stratum of the organisation from which this information was taken was disconnected with conflicting information permeating from the operational level. The reliance on external information occurred in instances where there was a lack of internal information providers or when senior decision makers chose to ignore internal sources. Both circumstances produced poorly informed decisions.

Option attributes. The political alignment option attribute was a decision factor that created an environment of option censorship. The political alignment of an option indicated the degree to which junior decision makers believed the option would match with the expectations of more senior decision makers. The factor affected decision makers at lower levels of organisations and encouraged them to only promote what they believed to be politically viable options into steering committees and senior decision making bodies. This factor was strongly connected to the confidence theme factor, lack of confidence or trust between IS and business units. In organisation A, decision makers in the IS department were careful to only promote options that they believed would succeed in their steering committee. This behaviour meant that options, although better organisationally, were discounted if they did not meet with what the IS department believed was politically viable. Thus the organisation was not assessing its IS based on

socio-technical match but instead on politics. In a similar fashion, organisation C discounted the possibility of building an in-house student records system because the option was not politically viable, not because of any other functional or organisational assessment. The outcomes of using this factor were flawed decision making processes that failed to optimise selections based on organisational needs.

Politics. Factors thematically grouped as politics consistently had the most negative effects. Politicised decision making environments shifted the focus away from making the best decisions for organisations to pursuing personal and business unit agendas. Placing organisational pressure on decision makers and IS departments led to ill-considered decision making processes, selections and implementation plans. Politically affected decision making bodies consisted of individuals who exerted varying power and influence. This meant that the voice and opinions of individuals, no matter how skilled, were not guaranteed a role in reaching a conclusion. However, the most far reaching political factor was low IS strategic alignment. This single factor had links with the broader themes of confidence and decision process and affected where opinions were sourced from and what information was used. Organisations that exhibited poor IS strategic alignment also made poor or sub-optimal decisions. Decision making was not transparent and decision makers often operated in an environment of deception or ‘game playing’.

8.6.4 Outcomes and factor use

Appendix K (see page 367) provides a cross-case comparison of factor importance in decision making. The table highlights decision factors where there was a considerable variation in factor influence and usage in organisations A and C, and organisations B and D. This division of cases has been developed from the analysis and the observation that some decision factors common to cases A and C were leading to negative outcomes, while others common to cases B and D were associated with positive outcomes.

Several themes are evident from this data. Firstly, decision factors that contributed to building vendor trust were important and confidence and trust in the vendor was associated with reaching positive decision outcomes. As noted previously, political factors strongly influenced decisions and were associated with negative outcomes. A related issue, lack of trust and confidence between IS and other business units, contributed to poor decision making. However, confidence and good communication between decision makers contributed strongly towards positive outcomes.

Acknowledgement of perceptions surrounding option suitability, alignment and fit contributed towards positive decision outcomes. These perceptions were enhanced by decision making processes informed by tangible organisational strategic alignment information. However, the consideration of an option's political alignment reduced organisational best-fit focus and detracted from decision making. Rigorous decision making processes were critically influential in achieving positive decision outcomes and using well informed experienced decision makers was essential. Using inexperienced, ill-informed decision makers led to poor decisions and poor outcomes. Finally, it was particularly important that decisions makers did not rely on vendor information alone.

8.7 Primary research question

The research questions examined so far have reported on specific aspects of the IS pre-implementation decision making processes, factors and outcomes. In order to address the broad aim of this research and reach conclusions, the findings are summarised in this section. To do this, findings addressing the primary research question:

What tangible and intangible information and contextual factors affect decision makers when making IS project pre-implementation decisions and how do these affect decision outcomes?

will be reported. The findings are then synthesised into broader themes, from which theory is proposed and justified.

8.7.1 Question summary

Fifty-six distinct factors (see Appendix C, page 344) were identified as having effects on decision makers. These consisted of twenty-five informational and thirty-one contextual factors (see Appendix D, page 349 and Appendix E, page 352). Eight broad thematic factor groups were identified: confidence, decision process, opinions, option attributes, organisation, perceptions, politics and vendor attributes. Nine key decision factors as summarised in Appendix G (see page 357) were identified as having considerable influence across case study organisations.

The majority of informational factors were tangible; however, the most influential informational factors had intangible characteristics. There was approximately the same number of tangible and intangible contextual factors. No conclusive relationships could be drawn between factor tangibility and influence in contextual factors. Organisations that had open and transparent decision making process were more likely to disclose the use of intangible decision factors in decision justifications. Most undisclosed factors were contextual; however some of the most influential were informational. A majority of undisclosed factors were tangible; however the most influential had intangible characteristics. Undisclosed factors also had more influence on decision makers than disclosed factors.

Evidence from the studies confirmed the a priori argument that there is a link between IS pre-implementation decisions and organisational outcomes. This link was particularly evident in organisation C where poor pre-implementation had negative short and long-term outcomes. Factors acted in concert to contribute to outcomes and many factors also acted indirectly. For example, political and historical influences indirectly affected who

made decisions, how they were made and what information was sourced or used.

Negative factor-outcome relationships were more observable than positive ones, in particular, the relationship between vendor sales pitch and demonstrations and poor organisational outcomes. Factor-outcome relationships were more observable when examined thematically. This section provides a summary of findings relating to factor themes, their effects on decision making and the associated decision outcomes.

Confidence. Confidence factors related to the levels of trust the organisation had in decision makers, the trust and communication within decision making groups and the trust decision makers had in the process and options. Organisations with a history of IS failure or a lack of confidence in IS decision makers tended to make decisions differently, often at higher levels of the organisation. These factors were precursors to poorly informed decisions and poor decision outcomes. Conversely, organisational confidence in IS decision makers changed who made decisions and what information was considered. This led to more informed decisions and positive outcomes. Good communication and trust between decision makers were other essential elements that contributed to positive decision outcomes. Without trust, decision makers were not open about what factors they used to inform their decisions. This led to deception and a lack of internal and external transparency in the decision making processes.

Decision process. The process taken to evaluate information in order to reach decisions had significant effects on decisions and decision outcomes. The decision style, either informal or formal, was used to different effects, depending on the context. Formal decision making processes provided rigour and added to the transparency and integrity of evaluations. Decision makers who used formal processes were generally more focused on delivering the best organisation-product match: this contributed to positive outcomes. Informal processes used in concert with formal processes provided a mechanism for simplifying and speeding up complex decision making. It was also a

way of effecting change and acceptance of new technology within organisations.

However, having experienced and informed decision makers was critical to making good decisions. Inexperienced decision makers used mainly external information sources rather than internal expertise, relied on vendor information and did not explore all options. This led to poorly informed decisions and outcomes.

Opinions. The use of external opinions in IS pre-implementation decision making was related to the levels of internal expertise. Organisations that had reliable internal information sources tended to prefer these over external sources. This is not to say external sources were not used, however they were not primary information sources. External opinions were also noted to have more effect on senior managers and could lead to overt political interference in decision making. The use of internal opinions was associated with positive decision outcomes as the information was regarded as more reliable. Using primarily external opinions was associated with negative decision outcomes as the quality was poor and often the wrong type of information was sought.

Option attributes. Decision makers assessed options on their attributes, using different attributes depending on the organisational context. Notably, cost was not regarded as a major decision factor. Positive outcomes were observed when decision makers considered how well the options organisationally and strategically aligned. This led to good selection decisions and solutions that met the needs of the organisations. Negative outcomes were observed when an option's political viability became a consideration. This restricted decision options and optimised decision making for political, not organisational alignment.

Organisation. Organisational factors were important in providing context for decision making and affected how information was obtained and used. Organisational history and culture affected who made decisions and how the decisions were made. Positive

outcomes were observed in organisations that used decision making processes that were sensitive to the beliefs and needs of participants. In these instances, members of organisations were not threatened by potential change and confidence was built in both the processes and outcomes. This confidence created the groundwork for successful implementations. Negative outcomes occurred when there was a prior history of IS failure or poor relationships existed between IS departments and other business units. These factors created the environment for political interference in the decision making process because of a lack of confidence in IS decision makers. One key organisational factor was clear objectives and goals for the IS project. This factor was associated with positive decision outcomes as decision makers were able to evaluate options based on clearly defined goals. This led to structured and more transparent decision making processes with better selection decisions.

Perceptions. Perceptions were an important element in IS pre-implementation decision making. Many decision makers relied on gut feel and simple heuristics to simplify decision making. Gut feel was often a less tangible application of expertise but also encompassed the need for a solution to ‘feel right’. Although speeding up decision making, it was not clearly evident that gut feel led to positive outcomes. Because of the lack of transparency associated with the process, other tangible justifications were used to hide evidence of gut feel processes occurring. However, decision makers with expertise seemed to be able to accurately apply gut feel in a positive way to their decision making processes. Pre-decisional bias was notable in its effect on decision making as it shaped and constrained the evaluation process and the solutions considered. However, it was again difficult to draw firm conclusions as to its relationships, if any, with decision outcomes.

Politics. Political factors were synonymous with negative decision outcomes and had considerable effects on some decision making. IS pre-implementation decisions taken in

highly politicised environments were socio-political games rather than socio-technical evaluations. Politics affected who made decisions and the information that was sought and used. Politicised decision making was often poorly informed and subject to personal agendas and business unit competition. Decision making became subject to politics when there was poor IS strategic alignment or when there were low levels of confidence in IS decision makers. Politically based decisions delivered poor outcomes because decisions were not optimised for organisational needs.

Vendor attributes. Vendor interactions and attributes had significant effects on decision makers. Vendor sales pitch or demonstrations were regarded as having the most negative decision outcomes. Organisations with inexperienced or uninformed decision makers were more susceptible to sales pitch. Vendor sales information, when taken at face value and not validated, led to poor selection decisions. However, a broader and longer term consideration of vendor relationships was important to informed decision making. Decision makers who assessed vendors on their personality and cultural attributes, seeking alignment between organisations, were able to determine how well they could build and maintain relationships after the IS projects were completed. This was important, as quality vendor support was recognised as a critical factor in positive decision outcomes. Therefore, it was not surprising that organisations who had existing relationships and trust in vendors tended to choose them again. Broader issues of vendor stability, viability and market share were also important decision factors. These issues were again considered as part of the confidence-building process. Organisations that used vendor relationship and viability factors had more positive decision outcomes as their implementations were vendor supported. Organisations also had reassurance that their post-implementation support would be effective.

8.7.2 Findings synthesis

The findings and analysis from this research highlight a consistent theme of the importance of alignment. From this, it is posited that:

P1. To achieve positive decision outcomes from IS pre-implementation decisions, conditions for intra-organisational alignment must exist and

P2. To achieve positive decision outcomes from IS pre-implementation decisions, conditions for inter-organisational alignment must exist and

P3. IS pre-implementation decision outcomes alter intra- and inter- organisational alignment conditions.

The following sections expand on these propositions. Consistent with Eisenhardt's (1989) analysis methodology, a comparison with extant literature is provided in order to explain and build confidence in the findings. Information systems alignment literature will be introduced in order situate the proposed theory.

8.7.2.1 Intra-organisational alignment

From this research, intra-organisational alignment is defined as the degree to which there is alignment between the organisational requirements and the objectives and abilities of the individuals and business units involved in decision making. Intra-organisational alignment can be assessed at two levels: between the actual decision makers, and between IS departments and the remainder of the organisation.

Decision maker alignment refers to the levels of communication, skill and trust between decision makers. Good communication is essential in decision making as it builds a common understanding of the problem definition. It is important that each actor is able

to communicate their knowledge and opinions. Decision makers who share knowledge domains are better able to develop and assess decision options based on the same criteria. Each actor should be clear about what is being assessed and why. Trust between decision makers is also important in promoting openness and reduces the effects of biases. Decision making processes must be, and be seen to be, transparent.

Alignment between IS departments and other business units is also referred to as IS strategic fit (Chan & Huff 1992). However, the issue of intra-organisational alignment extends beyond this. As already noted, organisational factors such as shared domain knowledge between business and IS executives, IS implementation success, communication between business and IT executives and connections between business and IT planning processes are indicators of alignment (Reich & Benbasat 2000). Luftman and Brier (1999) found that other enablers of alignment were senior executive support for IS, IS involvement in strategy development, IS understanding of business purpose, business-IS partnerships, well prioritised IS projects and strong IS leadership. Without these alignment indicators and enablers, the way in which IS pre-implementation decision making occurs is affected.

Decision making is affected by a lack of IS strategic alignment in two ways. Firstly, if decision makers have a poor understanding of the needs of the organisation, then misaligned technology selections, no matter how well implemented, can lead to negative outcomes. Baets (1992) supported this by noting that attempting IS systems alignment post-implementation is seldom a success. Secondly, decisions become politicised and focus is shifted away from achieving optimal organisational solutions. In these cases, decision making occurs at higher levels of the organisation where IS representation is limited or lacking in power. In such instances, poorly informed selection decisions can occur that can result in poor technological alignment and lead to implementation and ongoing support problems.

Chan (2002b) described a number of predictors of intra-organisational alignment.

Although specifically addressing the issue of aligning the operation of IS departments with the wider organisation, the findings have relevance to both aspects of intra-organisational alignment. Importantly, trust, credibility and faith were identified as alignment facilitators. As discussed previously, decision makers need to trust each other, but importantly, there has to be wider organisational trust in IS decision makers and IS departments. Informal structures and relationships were important within organisations. In IS pre-implementation decision making, these allow decision makers to identify problems, gain an understanding of organisational requirements and gather information. These social structures and ties consist of social networks, communities of practice and unofficially agreed upon practices. Chan (2002b) noted that a strong organisational culture was a facilitator of the use of informal social structures.

8.7.2.2 Inter-organisational alignment

From this research, inter-organisational alignment is defined as the degree to which there is alignment between the needs of the decision making organisation and the attributes of the vendor. Inter-organisational alignment can be assessed from two perspectives: functional alignment and relationship alignment.

Functional alignment is the assessment of how well a vendor's products or services align with the needs of the organisation. Assessing the functional match requires the decision making organisation to have both clear objectives from the project and an overall set of IS strategic objectives. To be able to assess functional alignment, decision makers must be skilled and know what information to gather. Vendor options that have functional alignment address both immediate functional requirements and conform to broader organisational standards and policies. Without functional alignment, the option selected will not match the organisation's needs.

Relationship alignment is an assessment of how well the decision making organisation will be able to interact with the vendor during and after the IS project implementation.

Strong vendor relationships are essential for positive long-term outcomes. Without vendor support and strong relationships, implementations can fail and post-implementation problems become difficult to resolve. A shared understanding of IS strategic and organisational goals is a condition for relationship alignment. Moreover, confidence, trust and existing relationships with the vendor can provide indicators of the level of relationship alignment. Vendor culture should also be closely matched with the decision making organisation, and vendor support is intrinsically dependent on interpersonal relations.

8.7.2.3 Outcome-alignment relationships

Once decisions are reached, their outcomes become part of the pool of informational and contextual factors that affect contemporaneous and future decision making. This feedback relationship is depicted in Figure 8-1.

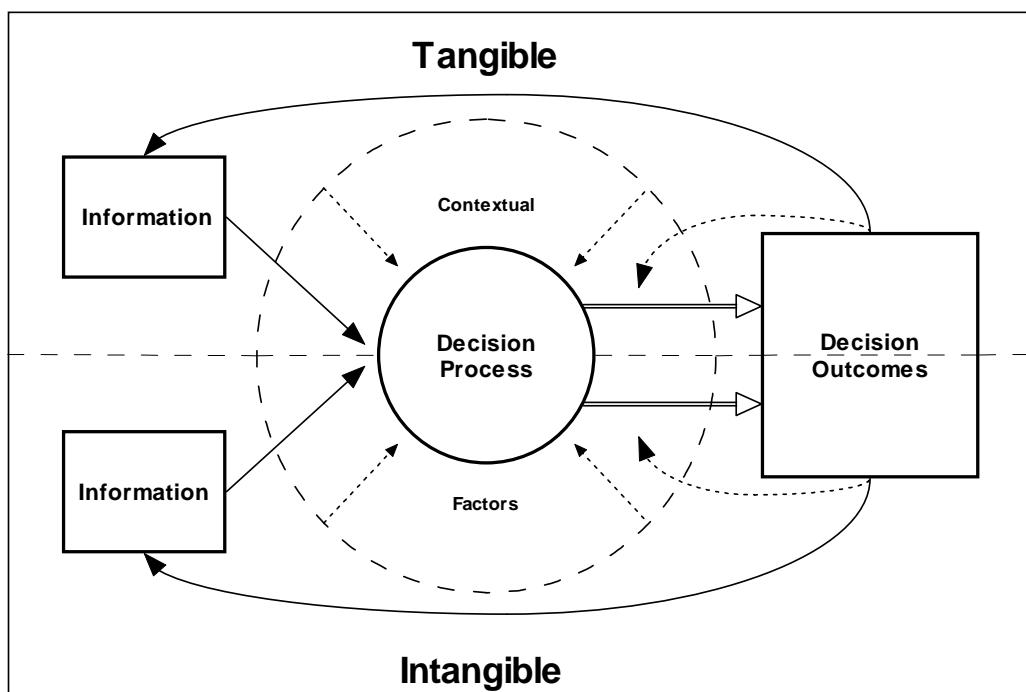


Figure 8-1 Contextual decision making model with feedback

Positive outcomes contribute to trust and confidence in decision makers and build intra-organisational alignment. Decision makers who achieve positive decision outcomes are less likely to be subjected to political interference in future decision making. Their opinions are valued and, because of their success, become associated with positive change. Positive outcomes also contribute to inter-organisational alignment conditions. Vendors associated with positive outcomes are more likely to be selected in future decisions. Positive vendor relationships, both personal and professional, build confidence and rapport. These factors have significant impacts on decision makers in future decisions.

Negative outcomes reduce trust and confidence in decision makers, which in turn negatively affect intra-organisational alignment. A lack of confidence in decision makers, especially those in IS departments, can lead to changes when future decisions are taken. Negative outcomes also provide avenues for politicisation of future decision

making and promote the beliefs that IS departments do not understand organisational goals and objectives. Inter-organisation alignment conditions are also affected by negative outcomes. Negative outcomes can lead to a reduction in the trust in a vendor. These can affect future decisions to the extent that even if vendors offer ideal functional solutions, they are automatically eliminated from consideration because of past experiences.

8.8 Comparative literature analysis

This section examines the key findings and analysis in the context of relevant comparative literature. The section begins by examining the attributes of the factors found to affect pre-implementation IS project decisions and concludes by examining factor-outcome relationships.

8.8.1.1 Factor and decision attributes

This study supported Baets' (1992) findings that decision makers sometimes operate using incomplete formal specifications and often deal with informal or intangible information. Findings align with Frishammar's (2003) study of decision making in that decision makers were found to have relied heavily on 'soft' information. Frishammar (2003) also found that decision makers initially used soft information to understand problems and to filter and interpret hard information. They would then apply analytical techniques to process the hard information, but would often return to soft information to reach a conclusion. The use of this style of decision making was observed in this study and supports findings relating to the prevalence of heuristic use from works of such authors as Eagly and Chaiken (1993), McCray, Purvis and McCray (2002), Wickham (2003) and Maqsood, Finegan and Walker (2004). In particular, this behaviour was indicative of what Weick (1995) described as 'sensemaking'. The observations from this study also support Weick's (1995) comments that decision makers filter and use

information by ‘seeing what one believes and not seeing that for which one has no beliefs’ (Weick 1995 p. 87).

In selecting and evaluating information, incidences of *Airline Magazine Syndrome* (Ramiller 2001) and Simon’s (1967b) satisficing behaviour were observed. It was also observed that information collection and evaluation was subject to Duhaime and Schwenk’s (1985) fallacious *reasoning by analogy* bias. However, findings differ with Frishammar’s (2003) study with regards to information sources. Frishammar (2003) concluded that strategic decisions were mainly informed by internal information sources. Although decisions with positive outcomes were informed by mainly internal sources, evidence suggests that organisations will sometimes rely heavily on external sources. However, these decisions are likely to produce negative outcomes.

Several decision making factors were identified that appear in the literature as decision justifications. These include time (Simons & Thompson 1998), cost (Ballantine & Stray 1999; Drinjak, Altmann, & Joyce 2001; Khalifa et al. 2001; Simons & Thompson 1998), political factors (Chung & McLarney 1999; Standing 1998) and contextual factors such as organisational culture, power structures and social or organisational norms (Child 1987). Other factors identified in the literature as affecting decision making such as the ability of the organisation to access information (O'Reilly 1990; Verville & Halingten 2002) and pre-decisional bias (Russo, Meloy, & Medvec 1998) were also found to have significant influence in this research. Findings also support opinions of Buss (1987) and Mintzberg (1972) that information concerning intangible factors can be more important than other tangible factors when making a decisions.

Even though a wide range of tangible and intangible factors were used to inform decision making, the most important justifications were tangible. This finding is consistent with the literature that indicates decision makers rely on justifications that

exhibit measurability (Heracleous & Barrett 2001; Myers 1994a; Myers 1994b; Myers & Young 1997; Ramiller 2001). Even so, apart from a single instance, findings do not support the conventional understanding that evaluations focus heavily only on financial costs and returns (Ballantine & Stray 1999; Doherty & King 2001; Irani & Love 2001; Lin & Pervan 2001; Verville & Halingten 2002). It is notable that the organisation that justified its decision on cost savings also had the most negative decision outcomes.

Findings of use of undisclosed factors in decision making were consistent with the indications from the literature that causal factors are not always explicitly acknowledged in decision justifications (see for example Davis et al. (1992), Myers (1994a; 1994b), Ramiller (2001) and Heracleous & Barrett (2001)). However, the levels of use were higher than expected or noted in the literature.

8.8.1.2 Factor-outcome relationships

A dominant theme of the decision factor-outcome relationships was intra- and inter- organisational alignment. Although there has been considerable research into the effects of IS strategic alignment within organisations, it has not been applied to an examination of IS pre-implementation decision making. However, there are significant commonalities between enablers and conditions for IS alignment and factors that led to positive decision outcomes. Conversely, inhibitors of alignment were also present in factors that led to negative decision outcomes.

There is recognition that alignment issues, such as organisational alignment, are critical for the successful use of IS and that alignment is pivotal in contributing to organisational profitability and productivity (Martin, Gregor, & Hart 2005). Martin, Gregor and Hart (2005) examined enablers within a contextual model and concluded the ‘soft’ aspects of IS alignment are important. This is consistent with the findings from this research that

many soft, intangible factors had significant influence on intra- and inter-organisational alignment.

Baets (1992) supported the belief that important IS decisions should be aligned with organisational strategy because post-implementation alignment of IS systems is seldom a success. However, Baets (1992) did not propose any specific factors that should be considered by decision makers. Chan et al. (1997) found that IS strategic alignment is a better predictor of IS effectiveness and organisations with high levels of IS strategic alignment perform better. Chan et al. (1997) also supported Baets (1992) and proposed that intended IS strategy (direction) decisions should be checked for IS alignment.

However, Chan and Huff (1992) noted that it should not be assumed that a conscious strategic awareness exists amongst all actors in organisations. They found that a greater awareness of organisational goals will be found at the executive levels. Although this is supported by findings from this research, it should be noted that decision makers at executive levels are also removed from operational system requirements, thus are not necessarily better at making technology decisions.

There were commonalities between decision factors that contributed to positive outcomes and factors identified from the literature that led to alignment. Of particular note, Reich and Benbasat (2000) found that IS implementation success and communication between business and IS executives were important. Luftman and Brier's (1999) findings concerning alignment enablers and inhibitors were also evident in decision making factors, as evidenced in Table 8-3 and Table 8-4.

Enabler	Factor
Senior executive support for IS	History and culture Confidence or trust in IS-Business units
IS involvement in strategy development	History and culture Confidence or trust in IS-Business units
IS understands business purpose	History and culture
Business/IS partnership	History and culture Confidence or trust in IS-Business units
Well prioritised IS projects	History and culture Confidence or trust in IS-Business units
IS demonstrates leadership	History and culture

Table 8-3 Alignment enabler-factor relationships

Inhibitors	Factor
Lack of IT/Business relationships	History and culture Lack of confidence or trust in IS-Business units
IS does not prioritise well	History and culture
IS fails to meet commitments	History and culture Previous record of IS failure
IS does not understand business	History and culture
Senior executives do not support IS	History and culture Lack of confidence or trust in IS-Business units
IS management lacks leadership	Political environment History and culture Lack of confidence or trust in IS-Business units

Table 8-4 Alignment inhibitor-factor relationships

Supporting the need for intra-organisational alignment, Chan (2002b) noted that poor business-IS alignment can result in costly IS investments with poor yields and returns. Chan (2002b) described two cases in which this occurs. Firstly, poor business-IS alignment occurs where business executives are unable to communicate or articulate their IS needs to IS decision makers. Secondly, poor business-IS alignment occurs when IS staff lack business vision and knowledge to make IS decisions with significant organisational impacts. As noted in section 8.7.2.1 (see page 295), Chan (2002b) also drew relationships between the informal networks, culture and trust and alignment conditions.

Findings relating to the use of organisational alignment factors were also supported by Ba, Stallaert and Whinston's (2001) study which found that systems should have inbuilt incentives for the users to correctly use systems. This discouraged users from cheating and performing operations which distorted processes or data. They argued that systems need to match the way organisations and users perform operations:

A system incentive is aligned when a user's dominant strategy and preferred user behaviour correspond from an organisational perspective. That is, the agent can still freely determine his own behaviour and use of the system, but the most rational action, i.e., the action that is in his best interest, coincides with the action that benefits the organisation the most (Ba, Stallaert, & Whinston 2001 p. 227).

Fan, Stallaert and Whinston (2003) supported these findings, noting the need to consider this aspect of alignment in supply chain investment decisions. The authors argued for the inclusion of incentive systems as part of the design or consideration of new IS. Bendoly and Jacobs (2004) concurred and noted the importance of operational alignment in ERP systems with business processes for optimal organisational outcomes. Whyte and Bytheway (1996) also established a link between outcome success and alignment. They found that post-implementation perception of system alignment with business objectives is a contributor to success. However, this is a perception and does not necessarily mean the system is effective in delivering its intended functionality. Specific factors associated with negative outcomes identified in this research have also been noted in other studies as having relationships with project failure. These factors are detailed in Table 8-5.

IS project failure causes	Decision factors
Incomplete requirements (Davis et al. 1992; Field 1997; Kippenberger 2000; OASIG 1996; Rippingale 2003; Standish Group 1995)	➤ Inexperienced or uninformed decision makers ➤ Organisational pressure ➤ Low IS strategic alignment ➤ Time frame to complete ➤ Unclear organisational objectives from project
Unrealistic expectations (Davis et al. 1992; Field 1997; Rippingale 2003; Standish Group 1995)	➤ History and culture ➤ Inexperienced/uninformed decision makers ➤ Low IS strategic alignment ➤ Unclear organisational objectives from project
Lack of IS management or bad leadership (Kippenberger 2000; McBride 2004; Standish Group 1995)	➤ History and culture ➤ Low IS strategic alignment ➤ Unclear organisational objectives from project
Technology illiteracy of management (Davis et al. 1992; Standish Group 1995)	➤ Inexperienced or uninformed decision makers ➤ Low IS strategic alignment
Unclear objectives/inadequate definition (Field 1997; Kippenberger 2000; Rippingale 2003; Standish Group 1995)	➤ Inexperienced or uninformed decision makers ➤ Low IS strategic alignment ➤ Poor communication and trust between decision makers ➤ Unclear organisational objectives from project
Inappropriate personnel/lack of expertise (Cannon 1994; Field 1997; Kippenberger 2000)	➤ Inexperienced or uninformed decision makers ➤ Low IS strategic alignment
Poor communication (Davis et al. 1992; IT Cortex 2002a; Kippenberger 2000)	➤ History and culture ➤ Low IS strategic alignment ➤ Poor communication and trust between decision makers
Unrealistic timescale (Field 1997; Kippenberger 2000; Standish Group 1995)	➤ History and culture ➤ Inexperienced or uninformed decision makers ➤ Low IS strategic alignment ➤ Organisational pressure ➤ Time frame to complete ➤ Unclear organisational objectives from project
Project size (project too large) (Cannon 1994)	➤ Inexperienced or uninformed decision makers ➤ Low IS strategic alignment ➤ Unclear organisational objectives from project

Table 8-5 Failure cause and decision factor relationships

8.9 Conclusion

This chapter has presented the cross-case analysis of four case studies in order to address the research questions. Fifty-six distinct factors were identified as having effects on decision makers. These consisted of twenty-five informational and thirty-one contextual factors. Eight broad thematic factor groups were identified: confidence, decision process, opinions, option attributes, organisation, perceptions, politics and vendor attributes. Organisations did not disclose all decision factors in documented justifications and undisclosed factors had more influence on decision makers than disclosed factors.

The a priori argument that there is a link between IS pre-implementation decisions and organisational outcomes was confirmed from the results. Linkages were established between decision factors and decision outcomes and it was noted that factors often acted in concert or indirectly. Factor-outcome relationships were more observable when examined thematically.

A broader link between alignment, alignment conditions and positive decision outcomes was proposed, from which three constructs were developed. Firstly and secondly, to achieve positive decision outcomes from IS pre-implementation decisions, conditions for, intra- and inter-organisational alignment must exist. Thirdly, IS pre-implementation decision outcomes alter intra- and inter-organisational alignment conditions and affect future decisions.

The chapter has concluded by highlighting the relevant comparative literature in which the results are situated. The limitations and implications of the results will be discussed in the next chapter.

Chapter 9

Discussion and conclusions

9.1 *Introduction*

In the previous chapter, research question findings were detailed. In this chapter, contributions to knowledge, theory and practice are identified. Limitations are discussed and further research directions are proposed. The chapter begins by re-examining the rationale for this research and discusses how the identification of information systems (IS) pre-implementation decision making factors has contributed to addressing the aims of the research.

9.2 *Contributions*

In order to understand the contributions that have resulted from this research, it is necessary to re-examine the research aim. The aim of this research was to build a deeper understanding of relationships between decision making factors and decision outcomes. The need to build this understanding was derived from the identification of a gap in the literature surrounding the way in which researchers and practitioners understand how IS selection decisions are made. From the literature, an *a priori* argument was made that sustained high rates of failure in IS projects are related to poor decision making. It was argued that while implementation was an important aspect of IS projects, good pre-implementation decisions are critical in achieving success. However, little was known about how decision makers reached IS pre-implementation decisions, what factors affected them and how these factors ultimately affected decision outcomes.

By addressing the research aims, contributions have been made in three areas. Firstly, this research has contributed directly to knowledge by identifying a specific problem and an alternative lens through which IS failure can be examined. In addressing the research

questions, empirical answers have been provided that directly contribute to the body of knowledge. Secondly, contributions have been made to theory. In order to approach the research problem, a fusion of decision making literature was required to develop a theoretical framework. This fusion resulted in a contextual decision making model which provided a novel way of examining how decisions are made. From the research findings, modifications were made to the model. In addition, theory was developed upon and added to by synthesising the key research findings and aspects of IS strategic alignment literature. Finally, by applying both specific findings and theory developed from the research, a series of implications and recommendations for practice have been identified. These contributions are discussed in more detail in the following sections.

9.2.1 Contributions to knowledge

As discussed in chapter two, an ongoing concern for researchers and practitioners alike is the continued high rate of failure in IS projects. With an annual spend of over one trillion US dollars on IS projects world wide (Charette 2005) and a success rate as low as twenty-nine percent (Standish Group 2004), organisational investment in IS is fraught with risk. This study identified a gap between two areas of research that has potential to build a better understanding of why some IS projects fail while others succeed.

The first area of research concerned the predominant focus on reducing IS project failure through good implementation practices. Numerous studies had identified implementation factors relating to success and failure, yet none were consistent over multiple studies (Myers 1994a). It was evident from the literature that implementation, while an important aspect of an IS project, was not the only predictor of IS project outcomes. An argument was developed from literature and case examples that poor pre-implementation decision making is related to failure.

From this, a second line of investigation raised a number of questions surrounding *how* decisions were made. Little literature existed on how IS pre-implementation decisions occurred. These decisions included the selection of IS software and services. IS decision making literature borrows heavily from large capital acquisition decision making models and centres on the use of formal evaluations and metrics. Drawing from traditional decision making literature, decisions were seen as rational, fact-driven processes. However, some authors (for example, Verville and Halingten (2002)) were suggesting that our understanding of what was really happening in these ostensibly rational decision processes was very poor and required further investigation. Drawing together these two aspects of the literature, it became clear that there was a gap in the understanding of how IS pre-implementation decisions were made, what factors affected the decision making and how these affected outcomes. Identifying this gap was the first contribution to knowledge.

Although the empirical research findings described in chapter eight contributed to the broader body of knowledge surrounding organisations and IS pre-implementation decision making, it is the implications arising from these findings that are of greater importance. Foremost amongst these findings is strong evidence that IS pre-implementation decision making is not a purely techno-rational process. IS pre-implementation decisions are contextual and are subject to human and organisational influences. Decisions are not made on a purely factual or informational basis. Decisions are not even necessarily made on the basis of what is best for the organisations concerned. IS pre-implementation decisions with positive outcomes are socio-technical balances between contextual and informational, organisational and technical factors. Without balance and cohesion between these elements, poor IS pre-implementation decision making occurs.

The implication from this finding is that any examination of IS pre-implementation decision making must also encompass an organisational perspective. Other authors, such as Myers (1994b), have examined IS failure implementations in an organisational context, however the research in this thesis has taken the focus to the earlier stages of IS projects. It challenges organisations considering technology adoption to examine the organisational *and* technical rationale. This research has established that the organisational structures, knowledge sources, processes and the personnel used to make decisions are equally, if not more, important than technical assessment criteria.

9.2.2 Contribution to theory

In undertaking this research, literature has been drawn from disciplines including information systems, innovation and technology adoption theory, management decision making and organisational decision making. The research has fused organisational and contextual aspects of IS implementation studies, while drawing from a substantial body of decision making literature. In doing so, the research has extended decision making theory in the specific IS context. From the findings, additional linkages to existing IS strategic alignment theory have been made.

To undertake this research, a theoretical framework was developed that could encompass the elements of IS decision making. This framework was based on a synthesis of decision making literature drawing from authors including Simon (1967a; 1967b; 1997), Mintzberg et al. (1990), Heracleous (1994) and March and Simon (1958). The premise of the framework was that decision making is not a purely rational process (Mintzberg & Westley 2001), is rarely structured (Bannister & Remenyi 1999) and involves a complex interplay between tangible and intangible informational (Sarkis & Sundarraj 2000) and contextual factors (Hirschheim & Smithson 1987). The framework used the contextual decision making model depicted in Figure 2-4. The model represents decisions being influenced by informational and contextual factors, which

Pettigrew (in Mintzberg et al. 1990) believed was an important way of examining decision making. In this model, decision processes are shaped by contextual factors and can only be understood by explicitly exploring these elements.

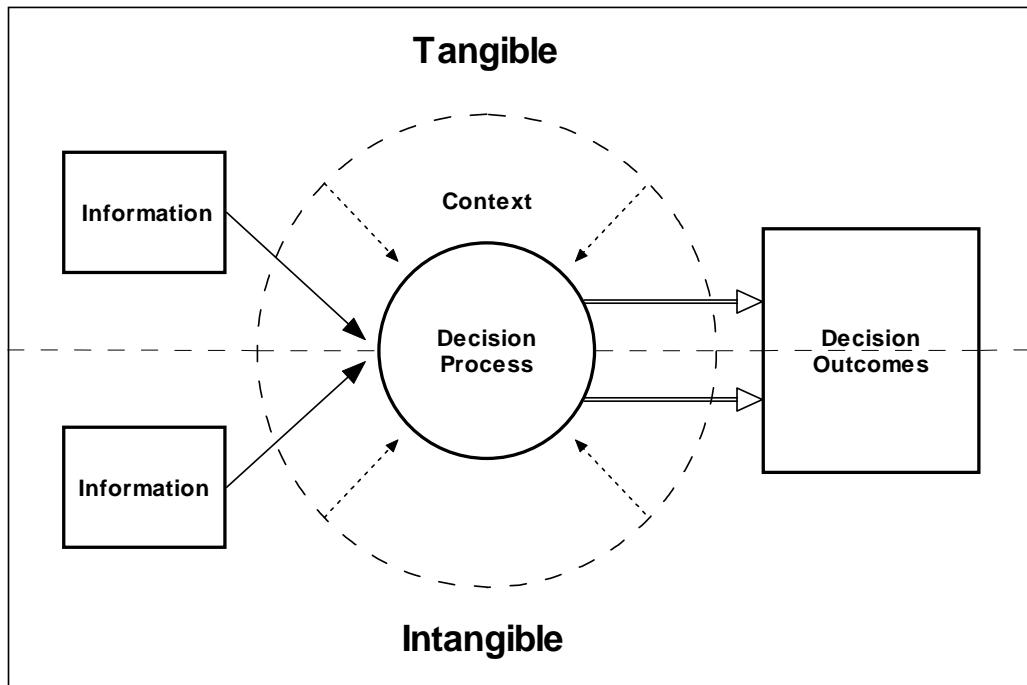


Figure 2-4 Contextual decision making model

The information used in these processes can also be subject to contextual influences as contextual factors are the lens through which information is processed. The model accounts for weaknesses in information gathering, that processing is imperfect and is often subject to bias (Duhaime & Schwenk 1985; Jamieson & Hyland 2006; Russo, Meloy, & Medvec 1998) and the use of heuristics (Eisenhardt & Zbaracki 1992; Maqsood, Finegan, & Walker 2004; McCray, Purvis, & McCray 2002; Wickham 2003).

The research findings have implications for large capital acquisition theory. This research has provided a specific extension to theory in the context of IS purchase decisions. The implications from these findings are that IS selections and acquisitions cannot be treated as a standard large capital purchases. IS is organisationally ubiquitous and cannot be viewed as a single piece of plant. IS does not work ‘out of the box’ and requires significantly more organisational planning to implement than other purchases.

Perhaps more importantly, IS cannot be seen as a tool that can be purchased, slotted in and used. Rather, organisations must ensure their processes are aligned or are willing to change to match the specifications of the product they select.

One emergent theme from this research was the observable effects of bias and heuristic information processing. While there is a considerable body of literature on individual use of heuristics to make complex decisions (see for example Eagly and Chaiken (1993), O'Reilly (1990) and Simons & Thompson (1998)), this research has provided evidence that these same methods are being applied to what are generally considered to be rational evaluations. From this research, the value of formal IS evaluations and business cases was questioned. Evidence suggests that an associative behaviour of heuristic use is substituting or retrofitting formal justifications. However, in groups of decision makers with common skills, understanding and trust, the use of heuristics is accepted, although it is still externally masked. Bias was also observed as an important element of IS pre-implementation decision making. Pre-decisional bias (Russo, Meloy, & Medvec 1998) was a critical element in shaping IS evaluation criteria, information gathering and decision making. These findings also challenge the existing theory that IS decision making is a rational process.

Research findings have extended theory surrounding IS strategic fit. While previous research as concentrated on the importance of post-implementation IS strategic fit, this research has demonstrated that alignment issues play a significant role in pre-implementation decision making. Findings indicate that without internal intra-organisational alignment between IS departments and other business units, sub-optimal decision outcomes are likely. In addition, elements of external (inter) organisational alignment between vendors and evaluating organisations form the basis for positive selection decisions. The linkages between conventional predictors of IS strategic alignment such as those described by Chan (2002b) and Luftman and Brier (1999) and

predictive decision factors from this research have provided an extension to the theory surrounding strategic alignment.

Finally, the research findings have led to an extension of the original contextual decision making model. Findings indicate that, as depicted in Figure 8-1, decision outcomes contributed to the pool of contextual and informational factors that affect contemporaneous and future decisions: this research has identified and explained the role of a number of such factors.

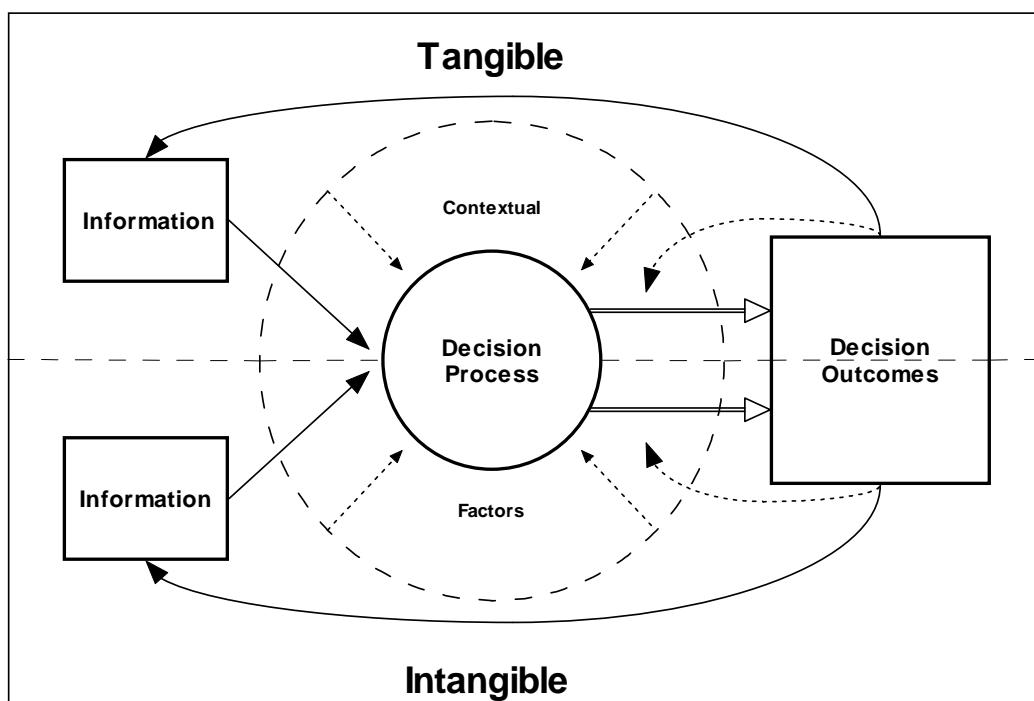


Figure 8-1 Contextual decision making model with feedback

This extension to the model provides a simple framework for describing how decisions occurred while capturing all the relevant components. It is anticipated that this model will undergo challenge and refinement in the future as a result of further research.

9.2.3 Contributions to practice

This research has been focused on issues surrounding IS decision making with the aim of developing a deeper understanding of the factors that affect decision outcomes.

Although these factors have theoretical implications for further research into decision making practices, it is their potential to minimise negative IS project outcomes that are of more immediate use to IS practitioners and decision makers.

The findings from this research indicate that before any significant IS investment decision is made, a number of organisational conditions need to be present in order to deliver positive outcomes. These conditions relate to confidence and interaction between IS departments and staff and the wider organisation. Organisational strategic fit between IS operations and the broader organisation is an essential pre-condition to evaluating any new technology. This requires established relationships between leadership roles from IS departments, such as chief information officers, and other organisational executives. These relationships require mutual understanding, trust and common understandings of business objectives. This research suggests that organisations need to establish clear business objectives before considering any IS adoption. Requirements gathering, scoping and planning should be precursors to technology selection decisions as opposed to concurrent or post-selection activities. Formalised, but flexible, evaluation processes should be used. These evaluation processes should be documented in order to promote transparency and should encompass both soft human and hard technical selection criteria.

Findings indicate that organisations seeking to maximise the probability of positive outcomes from IS pre-implementation decisions should give careful thought to the composition of the decision making body. Decision makers must all be aware of the scope and organisational impact of the decisions they are making. Although technology expertise is important in reaching a functional assessment, decision makers must be capable of making high-level strategic assessments. It is also important that high-level sponsorship and support of the decision making body is publicly demonstrated as this builds organisational confidence in decisions.

Although this study described a number of factor-outcome relationships, few acted in isolation and most were subject to the influence of other factors. However, findings indicate that practitioners should pay particular attention to vendor relationships in order to achieve long-term positive outcomes. Consistent and high quality vendor support is essential for IS project implementations and during the post-implementation acceptance phase. While decision makers need to assess vendor products for functionality, they also need to assess vendor personnel. Findings suggest that levels of cultural match and trust are good indicators of positive long-term outcomes.

However, practitioners need to be especially wary of information from vendors, especially if the individuals assessing the information are inexperienced. Vendor presentations and sales literature, although a valid part of IS evaluations, provide one-sided high-level perspectives of products and services. Using these as primary information sources for IS decision making results in poor organisational outcomes. In instances where organisations lack the internal expertise required to gather and evaluate all the necessary information to select an information system, consideration should be given to engaging external consultants. Indeed, this is an important assessment that organisations need to make as not recognising an institutional deficit in decision makers with the skills and knowledge required can result in sub-optimal decisions. Although many organisations engage implementation partners once selection decisions have been made, findings from this research indicating the negative outcomes associated with a lack of in-house expertise suggest that this engagement is too late in the process.

In summary, practitioners need to be aware that IS pre-implementation decisions are not techno-rationalist activities. Positive outcomes can only be achieved by ensuring that consideration is given to a broad range of social, organisational and technical factors.

Excluding any of these groups weakens the decision making process and the prospects for positive organisational outcomes.

9.3 *Limitations*

As discussed in chapter three (see section 3.5.3, page 78), this research does did not aim for statistical generalisability. By its very nature, the results the research produced were highly contextual. Even so, important commonalities and themes were evident across cases that detailed intricate and subtle findings. These findings could not have been elicited without the use of a constructivist study. From the findings, theoretical generalisability was achieved, although other researchers may wish to undertake further statistical work to test the theory produced.

Where possible, data was triangulated between sources, however the integrity of the information relied on the honesty and transparency of interviewees and documentation; because of this, a critical hermeneutic approach (Myers 1994b) was essential. It was important to not unconditionally accept interviewees' own views on particular topic. Instead, the information had to be critically evaluated and within a social and historical context. This interpretation by the researcher was both a potential source of error, or, as Klein and Myers (1999) suggested, a strength in the research process.

9.4 *Further research and work*

Findings from this research suggest a number of avenues for further research and work. Most of the promising research avenues centre on testing and applying the intra- and inter-organisation alignment theory developed from this research. This section briefly describes a number of possible research projects and future work to be undertaken.

This research has resulted in the determination of fifty-six factors that affect IS pre-implementation decisions within the cases examined. From this, eight broad factor

themes were derived. As already discussed, statistical generalisability was not an aim of this research; however, some researchers may find it appropriate to test aspects of the research findings in a statistical survey. One aspect of such work that would have interest is research into the prevalence of the use of heuristics and ‘gut feeling’ in IS decision making. Related work into the prevalence and rationale behind pre-decisional bias in IS pre-implementation making would be of interest to practitioners and researchers alike.

Additional work is also required to test and refine theory developed as a result of this research. As discussed in chapter eight (see section 8.7.2, page 295), research findings indicate linkages between intra- and inter-organisational alignment and IS pre-implementation decision outcomes. The propositions derived from this research require broader testing in other contextual settings. Moreover, it may be of value to extend testing the theory into small-to-medium-sized enterprises to determine if both factor findings and theory span organisational size differences.

One aspect of this theory testing will require testing linkages between existing organisational IS strategic alignment and IS project outcomes. As part of this research, researchers may wish to examine the factors that are contributing to, or inhibiting IS strategic alignment. After identifying these factors, research should focus on how, if at all, these factors affect IS projects and outcomes. This research should pay particular attention to the levels of alignment between decision makers and would ideally include cross-disciplinary collaboration encompassing psychological and organisational decision making expertise.

Although research findings have been based on snapshots of organisations at particular times, there is evidence that there would be value in conducting longitudinal studies. This research would be particularly valuable in testing the feedback inclusive contextual

decision making model to establish the extent to which decision outcomes affect future decision making. Evidence from an extended association at one of the case sites indicated that erroneous decision making was compounded by subsequent poor decisions and negative outcomes eroded IS strategic alignment. This is consistent with the literature indicating that IS project success is an important enabler of IS strategic alignment (Reich & Benbasat 2000). Extending this theme, there may be of value in conducting additional research into the long-term effects from IS project outcomes on IS alignment and how these affect the way in which future decision making occurs.

Finally, the information from this, and future research, should be applied to develop improved decision making practices. Work needs to be conducted with practitioners to apply and test findings in IS projects. The first part of this work will require the development of a method of assessing if organisations are capable of making IS selection and adoption decisions. Secondly, where organisations are deemed at risk of making poor IS selection and adoption decisions, practical recommendations, some of which have been outlined in section 9.2.3 (see page 314), require development and dissemination. Finally, the outcomes from IS projects that have adhered to these recommendations require monitoring in order to report outcomes and refine theory and advice.

9.5 Final conclusions about the research question

This research has examined how decision makers gather and use information in order to make IS pre-implementation decisions. Research has focused on how informational and contextual factors affect decision makers and what relationships these factors have with decision outcomes. The research was based on an a priori argument derived from literature that there is a link between IS pre-implementation decisions and organisational outcomes. This argument was confirmed from the research findings.

Fifty-six distinct factors were identified as having effects on decision makers. These consisted of twenty-five informational and thirty-one contextual factors. Eight broad thematic factor groups were identified: confidence, decision process, opinions, option attributes, organisation, perceptions, politics and vendor attributes. Factors acted in concert on decision makers and their use was highly contextual. Few individual factors had consistent relationships with decision outcomes, however, thematically, strong trends were evident.

As a result of the findings, it is clear that IS pre-implementation decision making is not a techno-rational process. It is evident that social and organisational factors are equally, if not more important, in technology evaluations. For positive decision outcomes, organisations must consider the intra- and inter-organisational alignment components of decision making. Organisations must be mindful that past decisions form part of the contextual and informational context in which decision making occurs. Learning from previous decision making is essential, drawing from both good and bad outcomes. In order to do this, the learning process should not be politically punitive to individuals or sections of the organisation. Technical decision makers, particularly those in IS departments, must realise that IS decisions are critical to organisational stability and that decision making must be made on technical *and* organisational criteria. At the same time, senior decision makers and executives have to engage with their IS executives in order to build IS strategic alignment. Senior decision makers and executives should recognise that IS decision making is often beyond their sole abilities. They must learn to leverage from, or defer to, expert resources, be it internal or external, to inform the decision processes.

This research has examined four very different organisations with four very different IS decisions. The common thread was that each decision was critical to the organisation's operations and had long-term effects. This study has examined both positive and

negative outcomes. It has traced many of these outcomes back to pre-implementation decisions, and more importantly, particular groups of informational and contextual factors. This thesis does not pretend to offer *the* solution to the high rate of IS project failure, however, it has established knowledge and theory for researchers and practitioners to explore as part of a holistic approach to addressing the problem.

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Appendix A

Interview script

This appendix contains a copy of the script used by the researcher to guide the semi-structured interviews.

Interview questions (Interview script)

Organisational Structure and interviewees' role within the organisation

1. Describe the purpose of your organisation (e.g. education, consulting, manufacturing etc.)
2. Approximately how many people are employed by the organisation?
3. Can you provide a brief history of the organisation?
4. What is your job title?
5. What are your duties (what do you do)?
6. What would you describe as your area or areas of expertise?
7. To whom do you report to?
8. Who do you supervise directly?

IS within the organisation (History)

9. Are you aware of and can you describe how IS is used within your organisation?
10. How do you use IS in your daily duties?
11. Describe the history of IS projects within the organisation
12. Can you give some examples of IS projects that have been successful within your organisation?
13. Can you give some examples of IS projects that have been unsuccessful within your organisation?
14. What is the strategic importance of IS to your organisation?
15. Describe the current IS project and why it is being implemented

Decision Processes

16. Regarding the current IS project, what role did you have in the adoption and selection decisions? Would you categorise yourself as a decision maker, an information provider or both?
17. Who else was involved with the decision-making process?
18. Would you characterise the decision process as “formal” and structured or informal?
19. What did you think about the decision-making process? How could it have been improved?
20. What impact do you think your opinions and knowledge impacted on the final decision?
21. Were any justifications given for the decision? If so, what were they?

Factors and Information (Decision Maker)

22. What were the sources of information you used in the decision-making process?
23. What facts, information or opinions do you think affected your decision?
24. Were there any political, cultural or historical influences that affected your decision? If so, what were they?
25. Were there any other influences that you feel affected your decision?
26. Given what we have discussed, could you rank all the factors that affected the decision in order of importance?

Factors and Information (Information Provider)

27. What were the sources of information you used to inform the decision-making process?
28. What facts, information or opinions do you think affected the decision makers?
29. Do you think that there were any political, cultural or historical influences that affected the decision? If so, what were they?
30. Do you think there were any other influences that affected the decision?
31. Given what we have discussed, could you rank all the factors that affected the decision in order of importance?

Decision Outcomes

32. Have the initial decisions regarding the IS project affected other decisions?
33. Would you categorise the initial decisions as having good or bad outcomes for the IS project?
34. Would you categorise the initial decisions as having good or bad outcomes for the organisation?
35. (If Decision Maker) would you have made the same decisions now, based on the information and experience you now have, or would the decisions have been different? Why/Why not?
36. How do you think the organisation viewed the decisions? Were they supported or unsupported? Why?

Appendix B

Informed consent package

This appendix contains a copy of the informed consent pack provided to interviewees.



INFORMATION SHEET

Factors affecting management decisions in IS implementations

Investigator:

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SURVEY INFORMATION

Dear Participant

My name is Kieren Jamieson and I am performing research towards gaining a Doctor of Philosophy (Business). The purpose of this study is to investigate what information is used by senior managers when they make decisions about implementing Information Systems. To obtain this information, I will be interviewing a number of people from organisations who have, or are in the process of, implementing a large Information System.

Taking part in this research will involve being interviewed. You will be asked a number of questions relating to your experiences with the selection and adoption of Information Systems within your organisation. The interview will take a maximum of an hour of your time. I am interested in what you think: there are no right and wrong answers! You are free to refuse any specific question and may withdraw from the interview at any time.

The interview will be taped and transcribed to written notes: please advise me if you do not want the interview taped. The notes of the interview will not be seen by anyone except myself or my research supervisors. Any research published from the information obtained in interviews will not be attributable to individuals or organisations.

Throughout the course of the research, you are free to withdraw at any time, for whatever reason. If you wish to withdraw the information you provided, please contact me.

At the completion of this research, all written documents and tapes will be stored in a locked cabinet located in the Faculty of Informatics and Communication, Central Queensland University. The confidentiality of the interviews is assured.

Please contact Central Queensland University's Office of Research (Tel 07 4923 2607) should there be any concerns about the nature and/or conduct of this research project.

Having read this information sheet, I now ask that you complete and sign the consent form. Should you require clarification on any part of the research project, please ask me now.

Thank you for your time and contribution.

Kieren Jamieson

CONSENT FORM

Anonymity:

The confidentiality of the results of this study is assured. Under no circumstances will your name or the name of the institution for which you work appear in publications associated with this research.

*THROUGHOUT THE COURSE OF THE PROPOSED RESEARCH
PROGRAM, YOU ARE FREE TO WITHDRAW AT ANY TIME FOR
WHATEVER REASON*

Enquiries:

Any enquiries or concerns about the proposed research can be directed to Kieren Jamieson (07) 4930 6504 k.jamieson@cqu.edu.au or by writing to: Kieren Jamieson, School of Computing and Information Systems, Faculty of Informatics and Communication, Central Queensland University, North Rockhampton 4702.

Consent:

I have read the information provided on the information sheet. The nature and purpose of the research project has been explained to me. I understand that I may withdraw my consent and discontinue participation at any time without penalty or loss of benefit to myself. In signing this consent form I am acknowledge my agreement to participate as a volunteer in research factors affecting management decisions in IS implementations.

NAME: _____

SIGNATURE: _____

DATE: _____

CONTACT DETAILS: _____

Please contact Central Queensland University's Research Service Office (phone: 4930-9828) should there be any concerns about the nature and/or conduct of this research project.

I certify that I have explained to the above individual the nature and purpose of this research study, have answered any questions that have been raised and have witnessed the above signature. I have also provided the participant a copy of this signed consent document.

NAME: _____

SIGNATURE: _____

DATE: _____

Appendix C

Detailed findings

This appendix contains a table of findings of decision factors and justifications found in the research.

Theme	Factor	Type	Organisation A			Organisation B			Organisation C			Organisation D						
			Tangibility	Decision	Justification	Outcome effect	Tangibility	Decision	Justification	Outcome effect	Tangibility	Decision	Justification	Outcome effect	Tangibility	Decision	Justification	Outcome effect
Confidence	Confidence in options and process	-	I	H		+	-	H		+					-	L		+
Confidence	Confidence or trust between IS and business units	C					-	L		+					-	M		+
Confidence	Lack of confidence in decision makers	C									-	L			-			
Confidence	Lack of confidence or trust between IS and business units	C	I	H		-					I	H	M	-				
Confidence	Poor communication and trust between decision makers	C									I	H		-				
Confidence	Previous record of IS failure	C									T	H		-				
Confidence	Previous record of IS success	C	T	H		+	T	L		+	T	L		-				
Confidence	Requirement to build and maintain credibility	C	I	H		+/-					I	L		-				
Confidence	Trust and good communication between decision makers	C	I	M		+		H		+					I	H		+
Decision process	Experienced or informed decision makers	C	I	L			T	M		+	I				T	H		+
Decision process	Inexperienced or uninformed decision makers	C	I	L		-				I	H		-					

Theme	Factor	Type	Organisation A			Organisation B			Organisation C			Organisation D						
			Tangibility	Decision	Justification	Outcome effect	Tangibility	Decision	Justification	Outcome effect	Tangibility	Decision	Justification	Outcome effect	Tangibility	Decision	Justification	Outcome effect
Decision process	Lack of options or lack of option exploration	C	T	L	-	+/-	T	H	+/-	T	H	-	-	-	-	-	-	
Decision process	Lack of organisational confidence in process	C									I	H	-	-	-	-	-	-
Decision process	Reliance on vendor information	C	T	L	-					T	H	-	-	-	-	-	-	-
Decision process	Use of external information sources	C	T	L		T	L		T	M	-	T	L	-	T	L	-	-
Decision process	Use of formal process	C	T	H	+	I	L		T	L	-	T	H	-	T	H	+	-
Decision process	Use of informal process	C	T	M	+/-	I	H		+/-	T	H	-	T	M	-	T	M	+
Decision process	Use of internal information sources	C	T	L		T	L		T	L	-	T	H	-	T	H	+	-
Opinions	External opinions	I	I/T	H	-	I/T	H		I/T	H	-	-	-	-	-	-	-	-
Opinions	Internal opinions	I	I/T	H	+	I/T	H		I/T	L		I/T	H	-	I/T	H	+	-
Option	Compliance with technical standards	I	T	M	M													
Option	Cost	I	T	L	L	T	L		T	L	H	-	T	L	M	-	-	-
Option	Delivery date or time	I	T	M														
Option	Existing internal expertise	I	T	M	M	+			T	L	-	T	L	-	T	M	-	-
Option	Functionality (software and hardware features)	I	T	M	M		T	H	H	+/-	T	L	H	-	T	H	H	-
Option	Maturity and future viability	I					I	H	M	+	T	M		-	T	M	-	-
Option	Organisational or strategic alignment	I					T	M	H	+					T	H	M	+
Option	Political alignment	I	T	H	-				T	M	-				I	L	-	-
Option	Risk	I	T	L											T	H	-	-
Organisation	Clear organisational objectives from project	C	T	M	+	T	L	+							T	H	+	-

Theme	Factor	Type	Organisation A			Organisation B			Organisation C			Organisation D						
			Tangibility	Decision	Justification	Outcome effect	Tangibility	Decision	Justification	Outcome effect	Tangibility	Decision	Justification	Outcome effect	Tangibility	Decision	Justification	Outcome effect
Organisation	External relationships	C				T	M		+					T	L		+	
Organisation	History and culture	C	I	H		+/-	I	H		+	I	H		-	I	H		+
Organisation	Need for BPR	C									T							
Organisation	Organisational requirement	I	T	H	H		T	H	H		T	H	H	-	T	H	H	
Organisation	Time frame to complete	C	T	L			T	L			I	H		-	T	M		
Organisation	Unclear organisational objectives from project	C									T	M		-				
Perceptions	Alignment, fit and suitability	I					I	M		+					I	H		+
Perceptions	Alternative option flaws	I					I		M									
Perceptions	Gut feeling	I	I	H			I	H						-	I	H		
Perceptions	Pre-decisional bias	C	I	H			I	H		+	T	H		-	I	H		+
Politics	Composition of decision making body	C	T	L		-					T	M		-				
Politics	Direct political intervention	I	T	H		+/-												
Politics	Low IS strategic alignment	C	T	H		-					T	H		-				
Politics	Organisational pressure	C	I	H		-					T	H		-				
Politics	Political environment	C	I	M		-					I	M		-				
Politics	Political power structures	C	T	M		+/-					T	M			T	L		+
Politics	Political viability of option	I	T	M		+/-					T	L						
Vendor	Alignment with vendor culture or personalities	C				I	L								I	H		+
Vendor	Confidence or trust in vendor	C	I		M	I	H	H	+						I	H	L	+

Theme	Factor	Type	Organisation A			Organisation B			Organisation C			Organisation D					
			Tangibility	Decision	Justification	Outcome effect	Tangibility	Decision	Justification	Outcome effect	Tangibility	Decision	Justification	Outcome effect	Tangibility	Decision	Justification
Vendor	Existing vendor relationships	C	I	M	-	I	H	H	-	I	L	-	T	I	T	I	T
Vendor	Location or country of origin	I				T	L						T	T	T	T	L
Vendor	Reference sites	I				T	L						T	T	T	T	L
Vendor	Sales pitch or demonstrations	I	I	H	-	I	H	H	-	I	H	-	I	H	I	H	H
Vendor	Support or service levels	I	T	M	T	H	H	T	T	M	H	T	H	T	H	M	
Vendor	Vendor experience	I											I				M
Vendor	Vendor flexibility and responsiveness	I											I	H	I	H	M
Vendor	Vendor organisational viability and stability	I				I	L						I	H	I	H	L
Vendor	Vendor presence in organisation	I	T	M						T	H	H	T	H	I	L	
Vendor	Vendor size or market share	I											T	H	T	H	+

Appendix D

Informational decision factors

This appendix contains a table of informational factors found in this research.

Theme	Factor	Organisation A				Organisation B				Organisation C				Organisation D			
		Tangibility	Decision	Justification	Outcome effect	Tangibility	Decision	Justification	Outcome effect	Tangibility	Decision	Justification	Outcome effect	Tangibility	Decision	Justification	Outcome effect
Vendor	Vendor presence in organisation	T	M											I	L		
Option	Compliance with technical standards	T	M	M													
Option	Delivery date or time	T	M														
Option	Risk	T	L											I	L		
Vendor	Location or country of origin					T	L							T	L		
Vendor	Reference sites					T	L							T	L		
Option	Existing internal expertise	T	M	M	+					T	L		-				
Politics	Direct political intervention	T	H		+/-												
Politics	Political viability of option	T	M		+/-					T	L						
Vendor	Vendor flexibility and responsiveness													I	H	M	
Option	Cost	T	L	L		T	L			T	L	H		T	L	M	
Vendor	Vendor organisational viability and stability					I	L							I	H	L	
Option	Maturity and future viability					I	H	M	+	T		M		T	M		
Option	Organisational or strategic alignment					T	M	H	+					T	H	M	+
Option	Political alignment	T	H		-					T	M		-				
Perceptions	Alignment, fit and suitability					I	M		+					I	H		+
Vendor	Vendor size or market share									T	H	H		T	H		+

Theme	Factor	Organisation A				Organisation B				Organisation C				Organisation D			
		Tangibility	Decision	Justification	Outcome effect	Tangibility	Decision	Justification	Outcome effect	Tangibility	Decision	Justification	Outcome effect	Tangibility	Decision	Justification	Outcome effect
Confidence	Confidence in options and process	I	H		+	I	H		+	I	H		-	I	H		+
Vendor	Support or service levels	T	M	M		T	H	H		T	M	H		T	H	M	
Opinions	External opinions	I/T	H		-	I/T	H			I/T	H		-				
Option	Functionality (software and hardware features)	T	M	M		T	H	H	+	T	L	H		T	H	H	
Perceptions	Gut feeling	I	H			I	H							I	H		
Opinions	Internal opinions	I/T	H		+	I/T	H			I/T	L			I/T	H		+
Organisation	Organisational Requirement	T	H	H		T	H	H		T	H	H	-	T	H	H	
Vendor	Sales pitch or demonstrations	I	H		-	I	H		-	I	H		-	I	H		

Appendix E

Contextual decision factors

This appendix contains a table of contextual factors found in this research.

Theme	Factor	Organisation A				Organisation B				Organisation C				Organisation D			
		Tangibility	Decision	Justification	Outcome effect	Tangibility	Decision	Justification	Outcome effect	Tangibility	Decision	Justification	Outcome effect	Tangibility	Decision	Justification	Outcome effect
Confidence	Lack of confidence in decision makers								-				-				
Organisation	Unclear organisational objectives from project								T	M			-				
Confidence	Confidence or trust between IS and business units					I	L		+					I	M		+
Confidence	Poor communication and trust between decision makers									I	H		-				
Confidence	Previous record of IS failure									T	H		-				
Decision process	Lack of organisational confidence in process									I	H		-				
Organisation	External relationships					T	M		+					T	L		+
Politics	Composition of decision making body	T	L		-					T	M		-				
Confidence	Requirement to build and maintain credibility	I	H		+/-					I	L		-				
Decision process	Inexperienced or uninformed decision makers	I	L		-					I	H		-				
Decision process	Reliance on vendor information	T	L		-					T	H		-				
Politics	Political environment	I	M		-					I	M		-				
Vendor	Alignment with vendor culture/personalities				I	L								I	H		+
Confidence	Previous record of IS success	T	H		+	T	L		+	T	L		-				
Decision process	Use of external information sources	T	L			T	L			T	M		-	T	L		
Politics	Political power structures	T	M		+/-					T	M			T	L		+

Theme	Factor	Organisation A				Organisation B				Organisation C				Organisation D			
		Tangibility	Decision	Justification	Outcome effect	Tangibility	Decision	Justification	Outcome effect	Tangibility	Decision	Justification	Outcome effect	Tangibility	Decision	Justification	Outcome effect
Vendor Confidence	Existing vendor relationships	I	H	M	-	I	H	H	-	I	L	M	-	I	L	M	-
Decision process	Lack of confidence/trust between IS and business units	I	H			T	M		+	T	L			T	H		+
Decision process	Experienced or informed decision makers	I	L			T	L			T	L			T	H		+
Decision process	Use of internal information sources	T	L			T	L			T	L			T	H		+
Organisation	Clear organisational objectives from project	T	M		+	T	L		+	T	L			T	H		+
Politics	Low IS strategic alignment	T	H		-					T	H			T	H		-
Politics	Organisational pressure	I	H		-					T	H			T	H		-
Vendor	Confidence or trust in vendor	I		M		I	H	H	+					I	H	L	+
Decision process	Lack of options or lack of option exploration	T	L		-	T	H		+/-	T	H			T	H		-
Organisation	Time frame to complete	T	L			T	L			I	H			T	M		
Confidence	Trust and good communication between decision makers	I	M		+	H			+					I	H		+
Decision process	Use of formal process	T	H		+	I	L			T	L			T	H		+
Decision process	Use of informal process	T	M		+/-	I	H		+	T	H			T	M		+
Organisation	History and culture	I	H		+/-	I	H		+	I	H			I	H		+
Perceptions	Pre-decisional bias	I	H			I	H		+	T	H			I	H		+

Appendix F

Decision justifications

This appendix contains a table of justifications that were found in this research.

				Organisation A	Organisation B	Organisation C	Organisation D				
Theme	Factor	Type	Tangibility	Decision	Justification	Tangibility	Decision	Justification	Tangibility	Decision	Justification
Vendor Confidence	Vendor organisational viability and stability	I				I	L		I	H	L
Option	Lack of confidence or trust between IS and business units	C	I	H					I	H	M
Option	Compliance with technical standards	I	T	M	M						
Perceptions	Existing internal expertise	I	T	M	M				T	L	
Vendor	Alternative option flaws	I				I		M			
Vendor	Vendor experience	I									M
Vendor	Vendor flexibility and responsiveness	I							I	H	M
Vendor	Vendor presence in organisation	I		T	M				I	L	
Organisation	Need for BPR	C							T	H	
Vendor	Vendor size or market share	I							T	H	T
Option	Maturity and future viability	I				I	H	M	T	T	M
Option	Organisational or strategic alignment	I				T	M	H		T	H
Vendor	Existing vendor relationships	C	I		M	I	H	H	I	L	
Option	Cost	I	T	L	L	T	L		T	L	H
Vendor	Confidence or trust in vendor	C	I		M	I	H	H		H	L
Vendor	Support or service levels	I	T		M	T	H	H	T	M	H
Option	Functionality (software and hardware features)	I	T	M	M	T	H	H	T	L	H
Organisation	Organisational requirement	I	T	H	H	T	H	H	T	H	H

Appendix G

Key decision factors

This appendix contains a table of key decision factors found in this research.

				Organisation A	Organisation B	Organisation C	Organisation D							
Theme	Factor	Type	Tangibility	Decision	Justification	Tangibility	Decision	Justification	Tangibility	Decision	Justification	Tangibility	Decision	Justification
Opinions	External opinions	I	I/T	H		I/T	H		I/T	H				
Option	Functionality (software and hardware features)	I	T	M	M	T	H	H	T	L	H	T	H	H
Perceptions	Gut feeling	I	I	H		I	H					I	H	
Decision Process	Use of Informal process	C	T	M		I	H		T	H		T	M	
Opinions	Internal opinions	I	I/T	H		I/T	H		I/T	L		I/T	H	
Organisation	History and culture	C	I	H		I	H		I	H		I	H	
Organisation	Organisational requirement	I	T	H	H	T	H	H	T	H	H	T	H	H
Perceptions	Pre-decisional bias	C	I	H		I	H		T	H		I	H	
Vendor	Sales pitch or demonstrations	I	I	H		I	H		I	H		I	H	

Appendix H

Undisclosed factors

This appendix contains a table of undisclosed factors found in this research.

Theme	Factor	Type	Organisation A		Organisation B		Organisation C		Organisation D	
			Tangibility	Decision	Tangibility	Decision	Tangibility	Decision	Tangibility	Decision
Confidence	Lack of confidence in decision makers	C					-	-		
Option	Delivery date or time	I	T	M						
Vendor	Location or country of origin	I			T	L			T	L
Vendor	Reference sites	I			T	L			T	L
Option	Risk	I	T	L					I	L
Organisation	Unclear organisational objectives from project	C					T	M	-	
Politics	Composition of decision making body	C	T	L	-		T	M	-	
Confidence	Confidence or trust between IS and business units	C			I	L	+		I	M
Politics	Direct political intervention	I	T	H	+/-					
Organisation	External relationships	C			T	M	+		T	L
Decision process	Lack of organisational confidence in process	C					I	H	-	
Politics	Political viability of option	I	T	M	+/-		T	L		
Confidence	Poor communication and trust between decision makers	C					I	H	-	
Confidence	Previous record of IS failure	C					T	H	-	
Vendor	Alignment with vendor culture or personalities	C			I	L			I	H
Decision process	Inexperienced or uninformed decision makers	C	I	L	-		I	H	-	
Politics	Political environment	C	I	M	-		I	M	-	

Theme	Factor	Type	Tangibility	Decision	Organisation A		Organisation B		Organisation C		Organisation D			
					Tangibility	Decision	Outcome effect	Tangibility	Decision	Outcome effect	Tangibility	Decision	Outcome effect	
Decision Process	Reliance on vendor information	C	T	L	-			T	H	-				
Confidence	Requirement to build and maintain credibility	C	I	H	+/-			I	L	-				
Perceptions	Alignment, fit and suitability	I				I	M	+			I	H	+	
Option	Political alignment	I	T	H	-			T	M	-				
Politics	Political power structures	C	T	M	+/-			T	M	-	T	L	+	
Confidence	Previous record of IS success	C	T	H	+	T	L	+	T	L	-			
Decision process	Use of external information sources	C	T	L		T	L		T	M	-	T	L	
Organisation	Clear organisational objectives from project	C	T	M	+	T	L	+				T	H	+
Decision process	Experienced or informed decision makers	C	I	L		T	M	+	I			T	H	+
Politics	Low IS strategic alignment	C	T	H	-			T	H	-				
Politics	Organisational pressure	C	I	H	-			T	H	-				
Decision process	Use of internal information sources	C	T	L		T	L		T	L	-	T	H	+
Confidence	Confidence in options and process	I	I	H	+	I	H	+			I	L	+	
Decision process	Lack of options or lack of option exploration	C	T	L	-	T	H	+/-	T	H	-			
Organisation	Time frame to complete	C	T	L		T	L		I	H	-	T	M	
Confidence	Trust and good communication between decision makers	C	I	M	+	H	+				I	H	+	
Decision process	Use of formal process	C	T	H	+	I	L		T	L		T	H	+
Opinions	External opinions	I	I/T	H	-	I/T	H		I/T	H	-			
Perceptions	Gut feeling	I	I	H		I	H				I	H		

Theme	Factor	Type	Tangibility	Decision	Organisation A	Organisation B	Organisation C	Organisation D
					Outcome effect		Outcome effect	
Opinions	Internal opinions	I	I/T	H	+	I/T	H	I/T
Decision process	Use of informal process	C	T	M	+/-	I	H	+/-
Organisation	History and culture	C	I	H	+/-	I	H	-
Perceptions	Pre-decisional bias	C	I	H	-	I	H	-
Vendor	Sales pitch or demonstrations	I	I	H	-	I	H	I

Appendix I

Positive factor-outcome relationships

This appendix contains a table of positive factor-outcome relationships found in this research.

Theme	Factor	Type	Organisation A			Organisation B			Organisation C			Organisation D					
			Tangibility	Decision	Justification	Outcome effect	Tangibility	Decision	Justification	Outcome effect	Tangibility	Decision	Justification	Outcome effect	Tangibility	Decision	Justification
Confidence	Confidence or trust between IS and business units	C	I	L		I	L		+					I	M		+
Decision process	Experienced or informed decision makers	C	I	L		T	M		+	I				T	H		+
Decision process	Use of formal process	C	T	H		+	I	L		T	L			T	H		+
Opinions	Internal opinions	I	I/T	H		+	I/T	H		I/T	L			I/T	H		+
Option	Organisational or strategic alignment	I				T	M	H	+					T	H	M	+
Organisation	External relationships	C				T	M		+					T	L		+
Perceptions	Alignment, fit and suitability	I				I	M		+					I	H		+
Vendor	Confidence or trust in vendor	C	I		M	I	H	H	+					I	H	L	+
Confidence	Confidence in options and process	I	I	H		+	I	H		+				I	L		+
Confidence	Trust and good communication between decision makers	C	I	M		+	H		+					I	H		+
Organisation	Clear organisational objectives from project	C	T	M		+	T	L		+				T	H		+

Appendix J

Negative factor-outcome relationships

This appendix contains a table of negative factor-outcome relationships found in this research.

Theme	Factor	Type	Organisation A		Organisation B		Organisation C		Organisation D		
			Tangibility	Decision	Justification	Outcome effect	Tangibility	Decision	Justification	Outcome effect	Tangibility
Confidence	Lack of confidence or trust between IS and business units	C	I	H	-			I	H	M	-
Decision process	Inexperienced or uninformed decision makers	C	I	L	-			I	H		-
Decision process	Reliance on vendor information	C	T	L	-			T	H		-
Opinions	External opinions	I	I/T	H	-	I/T	H	I/T	H		-
Option	Political alignment	I	T	H	-			T	M		-
Politics	Composition of decision making body	C	T	L	-			T	M		-
Politics	Low IS strategic alignment	C	T	H	-			T	H		-
Politics	Organisational pressure	C	I	H	-			T	H		-
Politics	Political environment	C	I	M	-			I	M		-
Vendor	Sales pitch or demonstrations	I	I	H	-	I	H	-	I	H	-

Appendix K

Key factor-outcome relationships

This appendix contains a table of key factor-outcome relationships found in this research.

Theme	Factor	Type	Organisation A			Organisation B			Organisation C			Organisation D				
			Tangibility	Decision	Justification	Tangibility	Decision	Justification	Tangibility	Decision	Justification	Outcome effect	Tangibility	Decision	Justification	Outcome effect
Confidence	Trust and good communication between decision makers	C	I	M	+	H		+				-	H		+	
Decision process	Experienced or informed decision makers	C	I	L		T	M	+	I				T	H	+	
Decision process	Inexperienced or uninformed decision makers	C	I	L	-				I	H		-				
Decision process	Reliance on vendor information	C	T	L	-				T	H		-				
Politics	Political environment	C	I	M	-				I	M		-				
Vendor	Alignment with vendor culture or personalities	C				I	L					I	H		+	
Vendor	Support or service levels	I	T	M		T	H	H	T	M	H		T	H	M	
Vendor	Vendor organisational viability and stability	I				I	L					I	H	L		
Option	Maturity and future viability	I				I	H	M	+	T	M		T	M		
Option	Organisational or strategic alignment	I				T	M	H	+				T	H	M	+
Option	Political alignment	I	T	H	-				T	M		-				
Perceptions	Alignment, fit and suitability	I			-	I	M		+			I	H		+	
Confidence	Lack of confidence or trust between IS and business units	C	I	H	-				I	H	M	-				
Politics	Low IS strategic alignment	C	T	H	-				T	H		-				
Politics	Organisational pressure	C	I	H	-				T	H		-				
Vendor	Confidence or trust in vendor	C	I	M		I	H	H	+			I	H	L	+	