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## **Factors that influence Information Systems decisions and outcomes: A summary of key themes from four case studies**

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### **Abstract**

*This paper reports a summary of key findings from an examination of Information Systems decision making in four organisations. The study focused on what factors influenced decision makers during the critical pre-implementation phase of Information Systems projects when systems were evaluated, selected and acquired. Using data gathered from interviews and organisational documentation, a critical hermeneutic analysis was performed in order to build an understanding of how informational and contextual influences acted on decision makers. Eight broad themes of factors were identified as having influence on decision makers and outcomes.*

**Keywords: Information Systems, Decision Making, Factors, Outcomes**

### **INTRODUCTION**

The viability and success of organisations is increasingly reliant on effective Information Systems, yet the incidence of successful IS implementation projects within organisations is very low (Standish Group 2004). Decision makers play a critical role in the evaluation, acquisition and implementation of IS in organisations (Buss 1987). Decisions are the processes and outcomes that result from assessing and evaluating factors. Decision making is the act of choosing among 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 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 paper presents a summary of findings from a study that has explored the influences on these decisions and discusses their effects.

A cross disciplinary approach 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 as the current approach to IS research often only focuses on the IS artefact. Often there is a bias towards systems attributes, with close examinations of the requirements of the users and subsequent implementations (see for example (Davis et al. 1992; Field 1997)). However some authors (for example, Myers (1994)) have considered the organisational or contextual aspects of IS implementations. This promising approach has resulted in a richer understanding of the problems surrounding IS implementations from an organisational, rather than techno-rationalist perspective. However, the nexus between decision making and IS implementations remains largely unexplored. While there is a substantial body of management and psychology decision making literature, little of it has been derived in an IS context.

The need to explore these links is important because organisations continue to make decisions to implement IS where the outcomes are poor. Poor outcomes for organisations range from total IS implementation failure to partial failure where systems fail to meet major organisational requirements. This problem highlights a divide between IS implementation 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. Although some organisational causes, such as lack of management support (Field 1997), have been identified, many studies have focused on physical implementation problems. This research approach has led to inconsistent findings and has not provided solutions that have reduced the IS failure rate. This would indicate that perhaps the failure of so

many IS projects may not be simply attributable to implementation issues. As such, the a priori argument for this study was that decisions taken in the pre-implementation phase of IS projects have an impact on IS project and organisational outcomes. This research aimed to explore this knowledge gap and gather empirical data surrounding how IS pre-implementation decisions occurred and what factors were used to inform the decisions.

## BACKGROUND LITERATURE

IS implementation is the act of designing, coding, testing and rolling-out a system as the result of IS project decisions (Murch 2001). However, there are a number of decisions relating to known success and failure causes taken before, during and after an IS implementation that affect the outcome of an IS project (Davis et al. 1992; Reel 1999). There is a high level of uncertainty as to why decisions are taken and how organisations can be sure they made the correct decisions. It is the assertion of the authors that the prevalence of IS project failure relates to poor decisions that are taken in the pre-implementation phase of IS projects and that there are direct relationships between the pre-implementation decisions, the factors considered and project outcomes.

Decisions are situation-behaviour combinations consisting of alternatives, uncertain events and consequences (Hastie 2001). A decision making process can consist of the three interrelated tasks of information acquisition, evaluation and feedback or learning (Einhorn & Hogarth 1981). 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). A "good" decision is one which 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 consequences 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.

Decision making is informed by tangible and intangible information, evaluated in context (Jamieson & Hyland 2004). 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). Examples of 'hard' factors that will affect decision-making include time (Simons & Thompson 1998), financial returns and cost (Simons & Thompson 1998). Soft factors include politics (Chung & McLarney 1999), heuristics and biases (McCray, Purvis, & McCray 2002), problem complexity (Simons & Thompson 1998) and existing/escalating commitment (McCray, Purvis, & McCray 2002). Some authors (for example, Buss (1987)) argue that intangible benefits can be more important than the tangible. It is the information that is fed into the decision making process that is used to develop decision alternatives and outcomes.

Decision making is not just about the evaluation of information within a vacuum. Pettigrew (1990) noted the importance of looking at decisions from a contextual angle. 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 made, but instead act on the information that is being fed into the process. 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). Child (1987) suggested a number of organisational factors that would affect capital investment decisions relating to innovation. These included organisational inertia, labour skills, organisational culture, power structures and social or organisational norms. Other common contextual influences on decision making include organisational resource levels (Arias-Aranda, Minguela-Rate, & Rodriguez-Duarte 2001), organisational structure (Gallivan 2001), the ability of the organisation to access information (O'Reilly 1990) and the level of uncertainty surrounding the information or decision (Buchanan & Kock 2000). It is the combination of these contextual factors, information and the decision process that lead to the final decision outcome.

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 goes against conventional beliefs that decisions to purchase or implement IS follow standard large capital acquisition practices. It is believed that such practices are the result of formal evaluations with logical justifications (Verville & Halington 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 1967). Furthermore, it is acknowledged that decision makers try to present a rational image but also can also be subject to subtle or uncertain influences that can alter their decisions.

While considering decisions relating to the selection and implementation of information systems in the context of decision theory, this study indicates 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) that can have negative organisational impacts. This is not to say that bounded rationality and irrational decision making always produces negative results. On the contrary, some apparently irrational decision making in the form of reliance on instinct and gut feel can produce good 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 the argument 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?

## RESEARCH PURPOSE

The purpose of the research was both exploratory and hypothesis building, also known as exploration and explanatory research (Yin 1994). Its aim was to develop deep understanding of the phenomena examined as well as the development of broader theory. The research aimed to explore the relationships between decisions and influencing factors and outcomes. In particular, the study set out to describe the relationships between factors or interactions between factors and decision outcomes. In addressing this broad objective, the research aimed to identify individual factors, their attributes (for example tangibility and influence), their interaction (for example, contextual or informational) and broader classification (for example, themes).

## METHODOLOGY

The qualitative research was conducted as non-contrived comparative studies where the units of analysis were organisations. The study was cross-sectional and data was gathered from four case studies. The case studies, based on Yin's (1994) methodology, were conducted in private and government organisations that had implemented large information systems. Within the case studies, a survey instrument was used as the primary information gathering tool with documentation and direct observation providing additional information. This design was chosen so as to use the surveys to provide exploratory and descriptive data within the case studies and give both breadth and depth to the data gathering. The four organisations used in this study were selected based on organisational attributes. Only two attributes were mandated selection criteria. Organisations were classed as larger than Small to Medium sized Enterprises (SMEs) and all had implemented significant IS projects. An additional condition of the research was the provision of anonymity for both organisations and interviewees.

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 maintains up to another two hundred contract staff. The organisation is distributed over more than a dozen power generation and administrative sites throughout Australia.

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, 1 aged care and support facilities such as food preparation, laundry and central administration. The organisation was originally established in the early part of the 20<sup>th</sup> century by a religious order and now has more than 1100 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.

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 Australian. In addition, the organisation maintains commercial agreements with offshore delivery partners to provide courses throughout the Asia-Pacific region. The organisation traditionally focused on domestic Higher Education Contribution Scheme (HECS) students who attended 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.

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 section that services over 1500 users spread over twenty locations throughout Australia and its territories.

The data collected from nineteen semi-structured interviews and organisational documentation was synthesised into case write-ups. A text based analysis was performed on the data which applied the Klein & Myers' (1999) interpretive research protocol. The analysis method was based on a hermeneutic technique used successfully by Myers (1994). This hermeneutic process followed the iterative loop that Yin (1994) described as explanation building. From the analysis, four individual case study narratives were produced. A cross case analysis, using Eisenhardt's (1989) method, was performed in order to build theory and address the research objectives.

## **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. Details of these factors can be found in Appendix A.

The majority of informational factors were tangible; however, the most influential informational factors had intangible characteristics, for example gut feeling and trust. 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. Evidence from the study confirmed that there is a link between IS pre-implementation decisions and organisational outcomes. Although linkages were established between decision factors and decision outcomes, single causal factor-outcome relationships could not be established as factors acted in concert to contribute to outcomes and many factors also acted indirectly. Negative factor-outcome relationships were more observable than positive ones. Factor-outcome relationships were more observable when examined thematically. The following sections provide a summary of findings relating to eight principal 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. For example, in organisation A the IT team spent more time building confidence in their decision that in making the decision. This promoted 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 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 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. In organisation B, the management team used a formal process for decision making and built in to the process stages that established a consensus style view of the decision, ensuring high levels of acceptance and minimal resistance. 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 and effecting change and acceptance. 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. For example, in organisation C, the levels of internal expertise were limited, so senior executives accepted the recommendations from individuals in equivalent positions in external organisations. This advice was poor because the external opinions were only relevant to the specific sites, were

political rather than operative perceptions and had very little information value. 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 (often lacking in detail), and often the wrong type of information was sought (high level sales information versus functional details).

### **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. For example, organisation D, while concerned with a good technology solution, focused on how well the overall solution would integrate with where the organisation wanted to be in the future. 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, fit. This was behaviour was observed in organisations A and C, where solid technical and organisationally beneficial options were eliminated based on the political games of senior decision makers.

### **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 processes that were sensitive to the beliefs and needs of participants. For example, key decision makers in organisation B were mindful of the organisational culture and used a consensus based approach. In such instances, people 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 between IS departments and other business units. This created the environment for political interference in the decision process because of a lack of confidence in IS decision makers. This was particularly evident in organisation C, where the decision making and evaluation was removed from individuals with IS knowledge and skills. One key organisational factor was clear objectives and goals from 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 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. In organisation A, senior decision makers admitted to making complex IS decisions based on gut feel and then retrofitting business cases and justifications. Gut feel was often a less tangible application of expertise but 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. One group of perceptions, pre-decisional bias, was notable in its effect on decision making. In every case studied, decision makers admitted that they had preconceived biases and beliefs, often to the extent that they were confident that they knew what the results of the evaluations would be before they began. Bias shaped and constrained the evaluation process and the options 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. This was particularly evident in organisation C, where competing elements of the organisation created an environment of distrust and a fractured approach to defining requirements. 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. Poor outcomes included excessive expenditure and projects that failed to deliver functionality.

### **Vendor attributes**

Vendor interactions and attributes had significant effects on decision makers. Vendor sales pitch/demonstrations were regarded as having the most negative decision outcomes. Organisations with inexperienced/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. This was particularly evident in organisation C, who based most of their evaluation on sales information. However, a broader and longer term consideration of vendor relationships was important to informing decision making. Decision makers who assessed vendors on their personality and cultural alignment were able to determine how well they could build and maintain relationships after the IS projects were over. 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. This was particularly important for organisation B, whose need for good personal relationships with the vendor support team was a key consideration. Broader issues of vendor stability, viability and market share were also important decision factors. These 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

## **DISCUSSION**

The findings and analysis from this research highlight a consistent theme of the importance of alignment. From this, three observations were made. Firstly, to achieve positive decision outcomes from IS pre-implementation decisions, conditions for intra-organisational alignment must exist. In addition, positive decision outcomes from IS pre-implementation decisions rely on conditions for inter-organisational alignment. Finally, IS pre-implementation decision outcomes alter intra- and inter-organisational alignment conditions.

### **Intra-organisational alignment**

Intra-organisational alignment refers to 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 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 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 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 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 these cases, poorly informed selection decisions can occur that can result in poor technological fit and lead to implementation and ongoing support problems.

Chan (2002) 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 network, communities of practice and unofficial agreed on practices. Chan (2002) noted that a strong organisational culture was a facilitator of the use of informal social structures.

### Inter-organisational alignment

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 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 selected option will not match the organisations 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 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 inter-personal relations.

### 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 1.

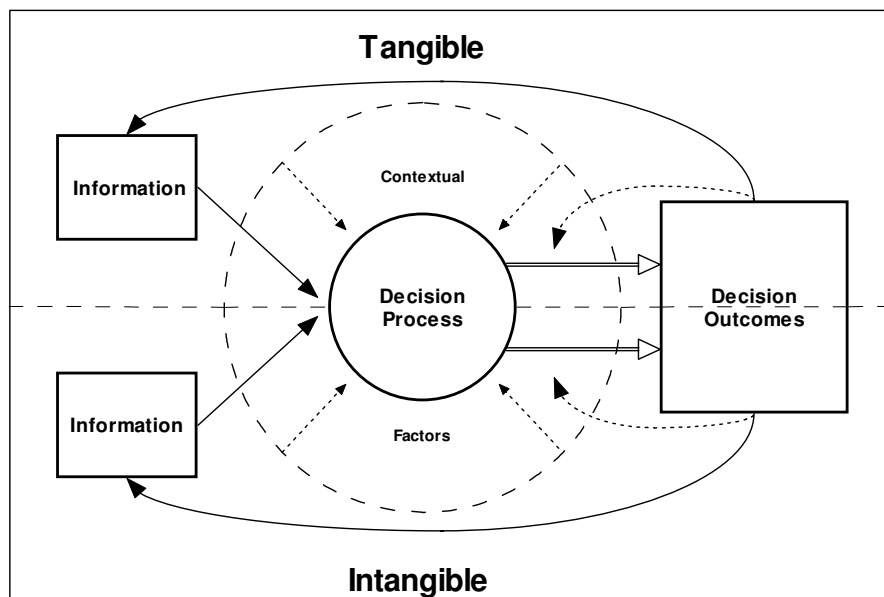


Figure 1 - Contextual decision making model (feedback version)

IS decision makers and senior managers need to be aware that 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 in where 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.

## CONCLUSION

This paper has reported a summary of results from a study into 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. 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 evident 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 paper does not claim to offer the solution to the high rate of IS project failure. However, it has presented knowledge and theory for researchers and practitioners to explore as part of a holistic approach to the problem.

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## APPENDIX A – DECISION FACTORS

<b>Theme: Confidence</b>
Confidence in options and process
Confidence/Trust between IS and business units
Lack of confidence in decision makers
Lack of confidence/trust between IS and business units
Poor communication and trust between decision makers
Previous record of IS failure
Previous record of IS success
Requirement to build and maintain credibility
Trust and good communication between decision makers

<b>Theme: Politics</b>
Composition of decision making body
Direct political intervention
Low IS internal strategic alignment
Organisational pressure
Political environment
Political power structures
Political viability of option

<b>Theme: Decision process</b>
Experienced/informed decision makers
Inexperienced/uninformed decision makers
Lack of options / Lack of option exploration
Lack of organisational confidence in process
Reliance on vendor information
Use of external information sources
Use of Formal process
Use of Informal process
Use of Internal Information Sources

<b>Theme: Perceptions</b>
Alignment, fit and suitability
Gut feeling
Pre-decisional bias

<b>Theme: Opinions</b>
External opinions
Internal opinions

<b>Theme: Option attributes</b>
Compliance with technical standards
Cost
Delivery date/time
Existing internal expertise
Functionality (software and hardware features)
Maturity and future viability
Organisational/Strategic alignment
Political alignment
Risk

<b>Theme: Vendor attributes</b>
Alignment with vendor culture/personalities
Confidence/Trust in vendor
Existing vendor relationships
Location/Country of origin
Reference sites
Sales pitch/demonstrations
Support/Service levels
Vendor flexibility and responsiveness
Vendor organisational viability and stability
Vendor presence in organisation
Vendor size/market share

<b>Theme: Organisation</b>
Clear organisational objectives from project
External relationships
History/Culture
Organisational Need/Requirement
Time frame to complete
Unclear organisational objectives from project

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