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A Preliminary Testing of the Strategic IT Decision Making Model

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Abstract Strategic IT decisions are critical and can result in major impacts on an organization's ability to remain competitive. Improved management of influencing factors on such decisions can lead to a reduction of cost overruns and greater return on the investment of large-scale IT expenditures. However, limited IS research has investigated strategic IT decision making processes and their associated influencing factors. To address the current knowledge gap, Tamm et al. (2014) proposed a Strategic IT Decision Making Model (SITDMM) based on a comprehensive literature synthesis. However, the SITDMM had not been tested with empirical data. This research-in-progress paper conducted a preliminary testing of the SITDM model by using a qualitative approach. An initial interview was conducted with a senior executive who was involved in a strategic IT decision at an Australian pharmaceutical company. The preliminary testing of the model demonstrates the usefulness of the SITDMM in capturing key influencing factors affecting the strategic decision making process in the case organization. This paper demonstrates that the Top Management Team played the most significant role in influencing the extent to which the SITDMM process was analytical, intuitive, and political. These factors influenced the final decision outcome. Future research will include the analysis of more strategic IT decision cases in order to further test the SITDMM and provide a framework which organizations can use to better assess and therefore manage factors influencing strategic IT decision making processes.

Keywords: Strategic decision making, Strategic IT decision, Strategic Decision Making process, Influence Factors, SITDMM, ERP

1 Introduction

Organizations in both developed and developing countries have adopted and implemented various technological innovations over time to stay competitive. Some technological innovations within organizations are strategic in nature because they have a broad impact across the entire organization and have short and long-term implications to the overall competitiveness. Such technologies typically require significant expenditure and need to be implemented over an extended period of time affecting a large number of stakeholders. Enterprise System (ES) applications such as Enterprise Resource Planning (ERP) systems are an example of strategic IT applications.

Implementing strategic IT applications, however, is a risky undertaking due to the size and complexity involved and the high investment required. Many studies show that the failure rate of ES implementation is significantly high in both developed and developing countries [1]. Many projects experienced cost overruns and struggled to gain the expected benefits from the ES investment, while some projects were altogether abandoned after significant expenditure had been made [2] [3] [4]. Most existing studies have associated such failures with ineffective project management without exploring decision making related to the associated IT projects [5] [6].

The decisions made by senior executives regarding strategic IT implementations including what, when and how the systems are to be implemented are likely to impact the ensuing outcomes. If all aspects of the decision making process are systematically accounted for and better managed, this may lead to more successful outcomes. Nevertheless, there are many challenges surrounding the determination of costs, benefits, risks and long-term implications on the future state of technologies, processes and management of the organization [7]. Furthermore, strategic IT decisions made by senior executives are often constrained by previous decisions which may have been made by different management teams with different sets of goals and interests [8]. Additionally, within the decision making team, there are personal biases and preferences that each member brings to the table which further complicate the decision making process [9]. Organizations rarely effectively manage such a variety of factors that influence their strategic IT decision making processes and associated outcomes. Therefore, a better understanding of strategic IT decision making including the process and key influence factors would provide further insights and potentially help decision makers establish necessary measures to avoid future failures.

Despite the importance of strategic IT decision making processes and their significant consequences on organizations, there has been limited IS research investigating the major factors influencing such processes. In addressing this knowledge gap, [10] proposed the Strategic IT Decision Making Model (SITDMM) that captures key factors influencing the strategic IT decision making process. This model, however, has not been tested and hence the applicability and comprehensiveness of the factors captured are still questionable. To contribute to the existing research efforts in enhancing the current understanding of strategic IT decision making, our study aims to investigate a strategic IT decision made by a large Australian organization to test the SITDMM. The key research question addressed is: *To what extent does the SITDMM capture key factors affecting a strategic IT decision making process?* To address the

research question, we conducted a qualitative research involving an interview with a senior executive from a large Australian organization and reviews of its relevant organizational documents. In this research-in-progress paper we include the findings of a preliminary testing of the SITDMM by examining the key factors that influenced a strategic IT decision process. This paper will focus on how this qualitative analysis was conducted for an Australian pharmaceutical company by providing examples of coded statements from the interview. The outline of this paper is as follows. In the next section, the SITDMM is presented with the 7 propositions. Then the research methodology and the context of the case organization are described. Findings are then presented and discussed. The paper concludes by summarizing key observations obtained from this study and explains the next step of the study.

2 The Strategic IT Decision Making Model

The SITDMM posits that strategic IT decision making processes are influenced by a number of key factors. [11] had previously delineated similar factors, by conducting a literature review, in relation to how these affected generic strategic decision-making. However, the factors identified by [11] had not been developed into an overarching model with propositions linked to the decision making process and final decision outcome. [10] extended the results of their own literature review to develop the SITDMM with propositions that could be more easily tested on interview datasets. The key factors that affect strategic-decision-making processes are presented by the model in Figure 1 and are grouped as 1) the decision context; 2) individuals and teams involved; and 3) the source and characteristics of the available information. The SITDMM seeks to capture the extent to which the strategic IT decision making process is analytical, intuitive and political by addressing the key influence factors. Even though similar factors have been previously discussed to some extent in the IS literature, no model comparable to the SITDMM had been derived until that presented by [10]. The SITDMM in Figure 1 presents factors that can impact the strategic IT decision process and subsequent decision. The influence of each factor can be positive or negative based on the context. The propositions make no claims about the outcomes of the influence of those factors shown in the SITDMM. The model only suggests that those factors are a relevant part of the decision process. Each module component of the factors and related propositions are briefly described below summarizing the previous literature research.

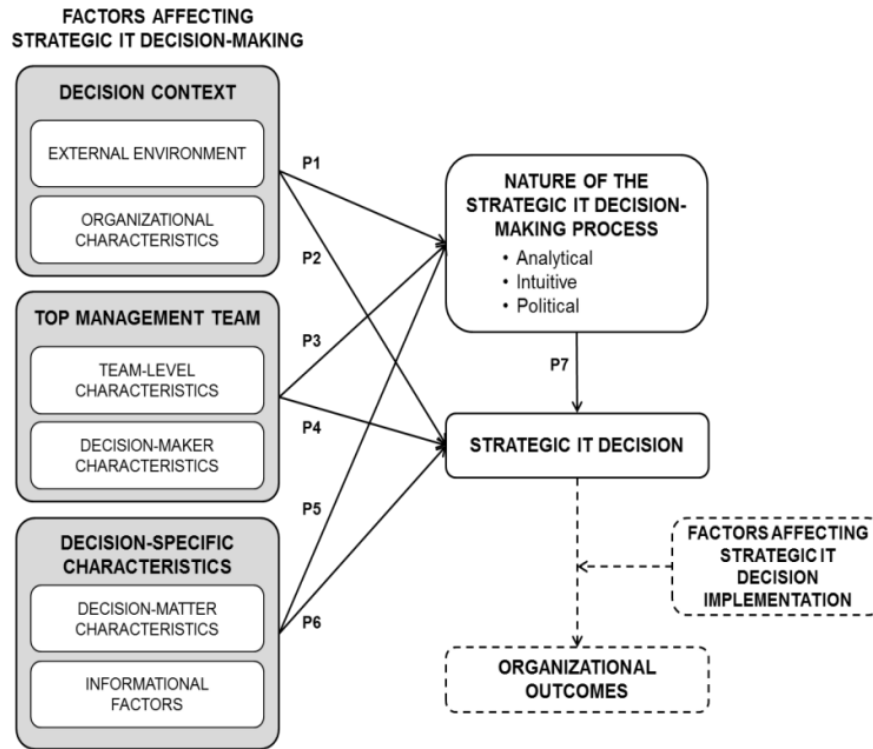


Figure 1. Influence factors of the SITDMM [10].

Decision Context refers to the nature of the environment in which the decision is made. The *external environment* includes national culture, legislation, economic climate, and environmental dynamism [7] [8]. The *organizational characteristics* include organizational culture, routines, processes, governance, and munificence [8] [9] [12]. It is posited that-

P1: *The Decision Context influences the nature of the Strategic IT Decision-making processes in an organization, especially the extent to which such processes are analytical, intuitive, and political*

P2: *The Decision Context influences the actual strategic IT decision made.*

Top Management Team is the group of senior managers and their advisors who make the final decision in terms of the strategic directions of the organization. The *team-level characteristics* refer to the collective characteristics of the decision team, such as team diversity (demographic, cognitive), size, team dynamics and routines, behavioural integration, and power distribution. The *decision-maker characteristics* refer to the individual characteristics of each decision team member that influence their perceptions of the decision problem, approaches to problem solving, and ability to influence others, e.g., cognitive style, personality, personal values, aspirations, incentives, and self-confidence [8] [9]. It is posited that:

P3: *The Top Management Team influence the nature of the strategic IT decision-making processes in an organization, especially the extent to which such processes are analytical, intuitive, and political.*

P4: *The Top Management Team influence the actual strategic IT decision made.*

Decision-Specific Characteristics refer to the characteristics of, and information relevant to, the specific strategic decision. The *decision-matter characteristics* include perceived decision importance, time pressure, motive (opportunity or threat), complexity, and politicality [8]. *Informational factors* refer to the information relevant to the strategic decision that is provided to or encountered by some or all of the decision team members and that affect their understanding of the decision problem and/or their preferred course of action. Sources of such information include internal analyst reports, opinions of peers, consultant advice, precedents and competitor actions, and press reports on technologies, their adoption, and economic outlook [10]. It is posited that:

P5: *The Decision-specific Characteristics of a strategic proposal under consideration influence the nature of the Strategic IT Decision-making processes, especially the extent to which they are analytical, intuitive, and political.*

P6: *The Decision-specific Characteristics of a strategic proposal under consideration influence the actual strategic IT decision made.*

Therefore, changes in the Decision-specific Characteristics of a strategic IT proposal under consideration may result in the Top Management Team making different strategic IT decisions.

Nature of the Strategic IT Decision-making Process refers to the characterisation of the decision process under three key dimensions [10]: (1) Analytical-Rational, the degree to which the process relies on detailed rational analysis of relevant factors, (2) Intuitive-Judgmental, the degree to which the decision team members rely on personal and/or collective intuition or “gut feel” in reaching their final decision [13], and (3) Political-Bargaining, the degree to which the process is characterized by political behaviour (e.g., coalitions, information tactics, use of external advisors) [7], [12]. Therefore it is posited that:

P7: *The extent to which strategic IT decision-making processes in an organization are analytical, intuitive, and political, influences the strategic IT decisions that emerge from the process.*

3 Research Methodology

In-depth qualitative research is considered appropriate to investigate strategic IT decision making which is complex in nature [14]. For our initial test of the key factors posited by the SITDMM an interview with a senior executive who was involved in a strategic IT decision at a large organization was conducted. For this research-in-progress paper, overall results for the initial analysis are presented as part of a preliminary testing of the SITDMM. The organization is a large pharmaceutical company. Current industry trends and other organizational documents (organizational chart,

reports, etc.) were used to contextualize the comments provided by the interviewee [15]. Three coders with IS Academic backgrounds then coded statements from the interview transcript of the CFO who was interviewed for this research.

Since information in the interview was provided in a narrative format, we considered the narrative analysis methodology to help improve our coding. Narrative analysis can be applied to assist with interpretation of the social context of interviewees [16]. The strength of evidence for the model was derived by coding statements [17] in the interview transcript in relation to the seven SITDMM propositions. Where only one statement in the transcript was found, a score of 1 was assigned; 2 was assigned for more than two statements, and zero (0) was assigned for no evidence. All results were then correlated and cross-coded. Rigor is addressed by following the guidelines by [18] and [14]. The research validity is further enhanced by conducting a thorough analysis of the relevant literature to ensure that we capture the valid factors and concepts, establishing chain of evidence through the use of case study repository, and a careful selection of the research participant. Reliability is ensured through the use of interview protocol and a pilot study with 2 senior executives to ensure the interview questions are appropriate.

4 Case Description

A major Australian pharmaceutical company, which for anonymity is referred to as PHARMA, is used to present an example of how the analysis was conducted in more detail. The increasing competition in the pharmaceutical industry has made modern ERP and Supply Chain Management (SCM) systems with demand forecasting capability critical to remaining competitive. With increasing changes to expectations of how the demand and supply of pharmaceuticals is managed, careful consideration of operating with an appropriate supply chain framework is needed by all pharmaceutical companies. Given PHARMA's large distribution network across Australia, appropriate access to information about supply and demand is essential. However the core module of the ERP was only just meeting their basic supply chain demands but could not provide demand forecasting and planning. The reliance on this core system meant that the company remained largely reactive rather than proactively delivering stock to the pharmacy outlets. PHARMA needed to increase their capability to forecast demand and create more predictive and proactive provisioning of supplies. PHARMA was confronted with two options: (1) implement a completely new ERP system or (2) upgrade. The final *decision to upgrade their existing ERP* was based on information provided by managers who were largely trusted by the decision making team.

The key decision making team comprised the Chief Executive Officer (CEO), the Chief Financial Officer (CFO), and the Chief Operations Officer (COO). The Chief Information Officer (CIO) reported to the CFO and was not directly involved in the decision making. Three other senior managers in sales, distribution and supply chain areas provided major input to the CIO. The supply chain manager in particular was new and produced a very convincing business case to upgrade the existing ERP based on a successful experience in a previous company. The executive committee placed a

high level of trust and did not spend sufficient time to investigate the available options due to time pressure. As a result, the outcome was not considered optimal since they ended up spending a significant amount of financial resources for little improvements to the existing system and capability.

5 Preliminary Testing

The testing of the model so far indicates that key influence factors presented by the SITDMM are evident. An initial analysis was conducted for PHARMA. Table 1 summarizes the strength-of-evidence obtained for each proposition at PHARMA.

Proposition	P1	P2	P3	P4	P5	P6	P7
Coder 1	1	1	2	2	2	2	1
Coder 2	2	1	2	2	2	1	1
Coder 3	2	1	2	1	1	2	1
AVG	<i>1.6</i>	<i>1</i>	<i>2</i>	<i>1.6</i>	<i>1.6</i>	<i>1.6</i>	<i>1</i>

Table 1. The Strength-of-Evidence (SoE) for each proposition: 1=1 statement and 2=2 or more statements.

Overall, the results indicate that the Top Management Team played the most significant role in influencing the extent to which the SITDMM process is analytical, intuitive, and political which has an implication on the decision outcome. Illustrative quotes from PHARMA provide examples of what was considered to be evidence for each of the propositions.

P1: Decision context influences the decision process. There is clear evidence that both the *external environment* such as markets and industry dynamics and *organizational characteristics* influenced the decision making process. For example, when explaining about the reason for deciding to upgrade the ERP system, the CFO asserts: “...some of that’s because of factors outside of our control ... the industry dynamics are changing....” The success of other companies in upgrading a similar ERP system appeared to affect PHARMA’s decision which shows the influence the *external environment*. The CFO indicates the influence of *organizational characteristic* by: “...someone who’s built up this power base around a core system” and how “some-one’s really pushed something into the business”. This indicates a more political rather than analytical decision making process.

P2: Decision context influences the decision. There was no evidence for *external factors* in influencing the final decision at PHARMA. For *organizational characteristics*, the CFO described “They [IT] were more sort of infrastructure focused and sort of run maintain focused.” This seems to have impacted the choice to upgrade the existing ERP.

P3: The Top Management Team influences the decision process. An example of the influence of *team-level characteristics* is where key decision makers at PHARMA placed a lot of trust in the information they were provided with: “The board would pretty much be guided by what management tell them.” The influence of *decision-maker characteristics* is also evident. Who is part of the decision team and how per-

suasive they are can also impact strategic IT decision making processes: *"I think some of that is very much driven by the leader of the organization"*.

P4: Decision team influences the decision. Indicative statements of how influential the *team-level characteristics* impact the final decision were identified. For example, *"...we did a lot of change so we brought in a whole new management team... and they'll often bring their biases from those organizations with them."* The supply chain manager apparently wanted the ERP system to be updated and upgraded: *"...he obviously came to the view pretty quickly actually that he wanted to both update and upgrade."* Furthermore, the final decision made at PHARMA was clearly influenced by the *decision-maker characteristics* of high levels of trust: *"...I think in hindsight myself and the CEO probably were guided by what the CIO was telling us."*

P5: Decision-specific factors influence the decision process. There is evidence of the influence of *decision-matter characteristics* since the supply chain manager deemed it was necessary to quickly take an action -based on minimal information- to address the issues caused by the previous ERP system: *"He put together a business case, he worked with the vendor of the SCM which is never a good thing quite frankly."* However due to the time pressure, thorough and objective assessments of the available options were not conducted. Moreover, the case confirms the influence of *informational factors* as the CFO explained the importance of gathering information from various sources during the decision making process. However, PHARMA did not address this factor very well: *"there wasn't enough work done."*

P6: Decision-specific factors influence the decision. The decision to upgrade the existing ERP system was significantly influenced by the urgency to improve the overall performance and competitiveness of PHARMA, which typifies the influence of *decision-matter characteristics*. As a result, the senior executives simply followed minimal information provided for the recommendation to upgrade: *"I kind of went off what they told me and I probably didn't dig below the surface."*

P7: The decision process influences the decision. The CFO believed that the decision making process was more intuitive which had led to a sub-optimal decision: *"In hindsight, I suppose it was more intuitive than political"*.

6 Discussion and Conclusions

The SITDMM provides a fundamental set of key factors that can influence strategic IT decision making. Through this research-in-progress paper, some initial insights have been established about how inter-related key factors impacted a strategic IT decision making process and its subsequent outcome. The overall scores of the strength-of-evidence provided for the seven propositions suggest that all factors in the SITDMM warrant careful consideration in relation to any strategic IT decision making. This preliminary testing of the SITDMM demonstrates that strategic IT decisions are influenced by an intricate combination of contextual, team, and decision-specific factors. Of most significance is the top management team, whose views, previous experiences and biases influenced both their analysis of information and contextual circumstances leading to final decisions. Since Proposition 3 (*The Top Management Team influences the decision process*) ranked highest in terms of strength of evidence

it is proposed that comprehensively managing factors related to the top management team may provide additional accountability and allow for a more reliable decision making platform. Reducing political clout, managing team biases from previous successes or failures of implementing IT in another context, and seeking more evidence based information may lead to improving such decisions.

Our study also highlights the fact that strategic IT decision making process often involves a considerable level of intuition, regardless of the effort to make the process analytical. Senior executives usually believe that they have been analytical in making specific strategic IT decisions, but they may later realize that intuition and politics have affected their decisions, as revealed by the CFO at PHARMA. Therefore, it is suggested that a thorough feasibility study is critical to avoid making rushed decisions based on insufficient information. As it is challenging to obtain accurate cost and benefit estimations of any large IT investments, the CFO recognized the importance of stage gating the process to help manage the overall strategic decision process and the related cost-estimation. This suggestion is in line with [19] and [20].

Additional insights that arose from the analysis indicate that senior executives do not always sufficiently question the validity of the evidence provided. The level of trust and relationship senior executives have cultivated with their teams appeared to be important in decision making. It is hence critical for senior executives to stay objective when dealing with strategic IT decision making. Ensuring adequate time to explore possible options and gather unbiased information from various sources would be useful to enhance strategic IT decision making as identified by this case.

For PHARMA we conclude that there are 3 key issues that affected the sub-optimal decision outcome. Firstly, there was time pressure to make a decision to address the ERP system limitations and declining organizational performance. The final decision to upgrade the ERP was not based on adequate assessment of possible options. Secondly, restrictive organizational structure and culture in which the CIO was not involved in the executive committee might have affected the decision making process. Limitations associated with the CIO's level of strategic decision-making authority as demonstrated in the PHARMA case have been identified in [21]. Without the direct influence of the CIO on the executive committee, it is challenging to properly align IT's contribution to organizational performance. Thirdly, ineffective cost-benefit analysis hampered the senior executives to make an optimal decision. The cost-benefit estimates provided by the managers and vendor were not reliable leading to cost overruns and a poor outcome.

Through this preliminary assessment of the SITDM model, we offer a modest contribution in enhancing the current understanding of strategic IT decision making that potentially may help improve the success of strategic IT projects. A better understanding of influence factors that can impact the decision making process can equip organizations to devise appropriate mitigation strategies to improve their overall strategic IT decision making process. Even though analytical dimensions are by far the most explored in IS research, the intuitive and political dimensions are just as important as is evidenced in this paper. Results of this initial analysis have previously been presented as a case study designed to provide teaching insights for graduate students about Strategic IT decision making [22]. With increasing interest in strategic decision making in organizations [23] the next step of our study will be to analyze interviews from more

case organizations. This should further refine our observations and testing of the influence of the key factors identified by the SITDMM. Ultimately a framework for Strategic IT decision making will be developed to assist organizations improve their decision making capabilities and outcomes.

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