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Bachelor Thesis Management Information System

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DECLARATION

I hereby acknowledge that I have worked on this Bachelor thesis titled
“MANAGEMENT INFORMATION SYSTEM” by myself and all used resources are
included in the bibliography and supplements section.

In Prague, 30.03.2012

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ADETOLA AKOLADE

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I thank Almighty God for the guidance. I would like to thank all the people that helped me to complete this project, particularly my committed supervisor Ing. Miloš Ulman, PhD, without whom this task would have been hard for me to complete

DEDICATION

I dedicate this Thesis to God Almighty who has been my source of strength and wisdom

**THE USE OF MANAGEMENT INFORMATION SYSTEM IN DECISION
MAKING IN AN ORGANIZATION**

**UŽITÍ INFORMAČNÍHO SYSTÉMU ŘÍZENÍ PŘI ROZHODOVÁNÍ V
ORGANIZACI**

ABSTRACT

To make good decisions, managers must have access to the latest and most accurate corporate data. Management Information Systems are designed to deliver this information to managers in a timely manner. The aim of this thesis is to increase the understanding of what occurs during decision making in an organization. A qualitative research method was applied in this thesis to develop two case studies. Research was conducted in private organisations that had implemented Management Information Systems. Actor prospective technique was used in a cross-case analysis in order to build theory and address the research questions. Twenty factors of information and relevant factors (contextual) were identified in this thesis as having effects on Management Information System in decision making. These factors fall into five groups, they are decision process, confidence, opinions, option attributes and organisation. The thesis concludes that there are connections between decision outcomes and decision factors.

Keywords: Nigeria, Czech Republic, Management information system, Information system, project, decision making, decision outcome, decision process

SOUHRN

Činit správná rozhodnutí, musí manažeři mají přístup k nejnovějším a nejpřesnější firemních dat. Manažerské informační systémy jsou navrženy tak, aby tyto informace pro manažery včas. Cílem této práce je pro lepší porozumění toho, co nastane během rozhodování v organizaci. Kvalitativní výzkumná metoda byla použita v této práci k rozvoji dvě případové studie. Výzkum byl proveden v soukromých organizací, které zavedly manažerské informační systémy. Herec perspektivní technika byla použita v případě cross analýzy s cílem vytvořit teorii a řešení výzkumné otázky. Dvacet faktory informací a relevantních faktorů (kontextová) byly zjištěny v této práci, že mají vliv na systém řízení informační na rozhodování. Tyto faktory se dělí do pěti skupin, jsou rozhodovací proces, důvěra, názory, možnost atributy a organizace. Práce dochází k závěru, že existuje spojení mezi rozhodnutím a výsledky rozhodovacích faktorů.

Klíčová slova: Nigérie, Česká republika, manažerský informační systém, informační systém, projekt, rozhodování, rozhodování výsledek, rozhodovací proces

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LIST OF ABBREVIATIONS

TABLE 1-1 TABLE OF DEFINITIONS

| Terms | Definition |
|--------------|--|
| MIS | Management Information System |
| IS | Information System |
| IT | Information Technology |
| CIO | Chief Information Officer |
| DM | Decision Making |
| PC | Personal Computer |
| SA | Software Applications |
| DM | Data Mining |
| DAI | Databases of Archived Information |
| CBDSM | Critical Business Data Stored on Microchips |
| MISN | Management Information System Networks |
| ENIAC | Electronic Numerical Integrator and Computer |
| CFO | Chief Financial Officer |
| ERP | Enterprise Resource Planning systems |
| GM | General Manager |

CHAPTER 1. INTRODUCTION

1.1 INTRODUCTION

In business today, having the right information is not enough anymore. In a world where competitors are extremely intense than ever, rapidly changing technologies alter the rules of the game daily and one big move can completely ruin your company, managers are seeking new techniques to make decisions.”*It is pardonable to be defeated, but never to be surprised.*”_Frederick the Great.¹

The main objective of this thesis is to analyze the factors that affect Management information systems (MIS) pre-implementation decisions and different ways of implementing M.I.S in an organization. This chapter begins with a brief overview of the background. The research problem is then described. The chapter concludes by describing the structure of the thesis and the definitions and acronyms used throughout the study.

1.2 BACKGROUND

Management information systems do not have to be computerized, but with today's large, multinational corporations, computerization is a must for a business to be successful. However, Management Information Systems began with simple manual systems such as customer databases on index cards. As early as 1642, the French mathematician and philosopher Blaise Pascal invented the first mechanical adding machine so that figures could be added to provide information. Almost two hundred years later, Charles Babbage, a professor of mathematics at Cambridge University in England, wanted to make a machine that would compute mathematical tables. He attempted to build a computing machine during the 1880s. He failed because his ideas were beyond his technical capabilities, not because the idea was flawed. Babbage is often called the father of the computer. With the advent of the computer, Management Information Systems became automated.²

¹ Kahaner Larry. Competitive Intelligence. How to gather, analyze and use information to move your business to the top. Touchstone, 1997.

² <http://www.enotes.com/management-information-systems-reference/management-information-systems-174371>

1.3 RESEARCH PROBLEMS

The addressed question in this thesis is:

When making MIS decisions, what information and factors that affect people making the decisions and how do these affect decision outcomes?

The following sub-questions are examined from this question,

- *What are the factors of information used by decision makers when making MIS decisions and how do these factors of information affect people making the decisions and decision making?*

- *What are the factors that affect decision makers, when making decisions, how do these factors affect decision makers and decision making?*

CHAPTER 2. OBJECTIVES AND METHODOLOGY

The chapter describes the objectives of the thesis and describes the details concerning how this thesis has been carried out.

2.1 OBJECTIVES

The main objective of the thesis is outlined as follows:

- a) To investigate the factors affecting decision makers and outcomes
- b) To make a documentary research of the use of M.I.S and its effect on decision
- c) Compare different ways of implementing M.I.S in a company and analyze effects of usage of M.I.S in a company.

2.2 METHODOLOGY

For the purpose of this thesis a qualitative research method was applied to develop two case studies. Research was conducted in private organisations that had implemented Management Information Systems. Actor prospective technique was used in a cross-case analysis in order to build theory and address the research questions.

Twenty informational and relevant or contextual factors were identified in this thesis as having effects on ERP package selection. These factors fall into five groups, they are decision process, confidence, opinions, option attributes and organisation. The thesis concludes that there are connections between decision outcomes and decision factors.

CHAPTER 3. LITERATURE REVIEW

3.1 MANAGEMENT INFORMATION SYSTEM IN DECISION MAKING

The role of information in decision making cannot be stressed more than necessary. Intended result in decision making demands accurate, timely and relevant information. According to Larry Kahaner, “*information resource is one of the major problems of organization planning*”.³ If the relevant information required for planning is not available at the appropriate time, there is bound to be a poor planning, inappropriate decision making, poor priority of needs and defective programming or scheduling of activities.

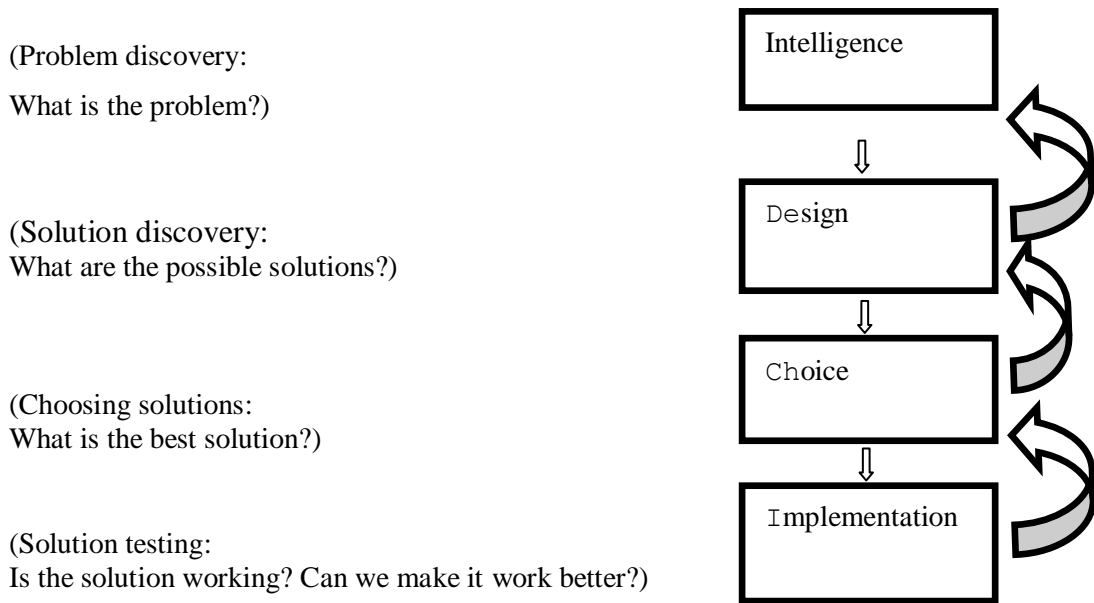
M.I.S provides several benefits to the business organization: the means of effective and efficient coordination between Departments; quick and reliable referencing; access to relevant data and documents; use of less labour; improvement in organizational and departmental techniques; management of day-to-day activities (as accounts, stock control, payroll, etc.); day-to-day assistance in a Department and closer contact with the rest of the world.⁴

MIS may be viewed as a mean for transformation of data, which are used as information in decision-making processes. Figure 1 shows this understanding about information as data processed for a definite purpose.

³<http://www.academicjournals.org/ERR/PDF/pdf%202007/May/Ajayi%20and%20Fademi.pdf>

⁴ http://www.diacritech.com/samples/interior_design/Computer-4color.pdf

FIGURE 1-1 PROCESS OF MANAGEMENT INFORMATION SYSTEM



Source: *Own work*

For an organization, information is as important resource as money, machinery and manpower. It is essential for the survival of the enterprise.

3.1.2 IMPACT OF MANAGEMENT INFORMATION SYSTEM

The impact of MIS on the functions is in its management. With a good MIS support, the management of marketing, finance, production and personnel becomes more efficient, the tracking and monitoring the functional targets becomes easy. The functional managers are informed about the progress, achievements and shortfalls in the activity and the targets. The manager is kept alert by providing certain information indicating the probable trends in the various aspects of business. This helps in forecasting and long-term perspective planning. The manager's attention is brought to a situation which is exceptional in nature, inducing him to take an action or a decision in the matter. A disciplined information reporting system creates a structured database and a knowledge base for all the people in the organization. The information is available in such a form that it can be used straight away or by blending and analysis, saving the manager's valuable time.

3.2 ORGANISATIONAL RESEARCH SIGNIFICANCE

(Charette 2005), it was conservatively estimated that over US one trillion dollars was spent on IS projects worldwide. MIS projects often involve the implementation of systems, infrastructure, services and technology that have not previously existed in an organisation: it is known 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. Research highlights that only one in eight information technology projects can be considered truly successful (failure being described as those projects that do not meet the original time, cost and (quality) requirements criteria).

Despite such failures, huge sums continue to be invested in information systems projects and written off. For example the cost of project failure across the European Union was €142 billion in 2004. (Dr John McManus and Dr Trevor Wood-Harper 2008)⁵.

3.2.1 FAILURE RATE

The Standish Group's CHAOS (2011) report indicated that there was marked increase in project success rates from 2008 to 2010. These numbers represent an uptick in the success rates from the previous study, as well as a decrease in the number of failures. The low point in the last five study periods was 2004, in which only 28% of the projects were successful. "This year's results represent the highest success rate in the history of the CHAOS Research, says Jim Johnson, chairman of The Standish Group, "*We clearly are entering a new understanding of why projects succeed or fail.*" This understanding is spelled out in the CHAOS Manifesto research report (Standish Group 2011)⁶.

Kippenberger indicated that UK studies from the ninety ninety's showed that sixty percent of MIS projects fail.

3.2.2 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 and assessing the risk and effort required for it

⁵ <http://www.bcs.org/content/ConWebDoc/19584>

⁶ http://standishgroup.com/newsroom/chaos_manifesto_2011.php

(IT Cortex 2002d; Standish Group 2011) with the desired functionality (Mahaney & Lederer 1999).

According to a KPMG survey of 252 organizations, inadequate project management implementation constitutes 32% of project failures, lack of communication constitutes 20%, and unfamiliarity with scope and complexity constitutes 17%; accordingly, 69% of project failures are due to the lack or improper implementation of project management methodologies. (Suntiva) Furthermore, in an article by Megan Santosus for CIO Magazine, ‘Why You Need a Project Management Office (PMO),’⁷ her research found that more than 50% of those organizations with a PMO claimed improved project success rates.⁸

3.2.3 FACTORS AFFECTING FAILURE

Factors such as incomplete requirement, lack of resources, and lack of planning have an effect on project success (Mahaney & Lederer 1999; Standish Group 1998:2000). It appears that as the cost of the project rises, so does the risk of failure (Standish Group 2000). Implementation issues such as lack of user involvement (OASIG 1996; Standish Group 2000), poor project management (Ainsworth 1999; Jim Johnson 2000; Kippenberger 2000), resourcing, risk management (Standish Group 2000; Whittaker 1999), organisational expertise and project size (Cannon 1994) also affect project outcomes.

⁷ http://www.cio.com/article/29887/Why_You_Need_a_Project_Management_Office_PMO_

⁸ <http://www.suntiva.com/blog/post/38/so,-your-organization-wants-to-establish-a-pmo/>

TABLE 1-2 SUMMARISES SOME OF THE FAILURE CAUSES IDENTIFIED IN THE LITERATURE.

| Failure cause | Reference |
|---|--|
| Unrealistic timescale | (Field 1997; Kippenberger 2000; Standish Group 2000) |
| Inappropriate personnel/lack of expertise | (Cannon 1994; Kippenberger 2000) |
| Incomplete requirements | (Davis et al. 1992; Field 1997; Kippenberger 2000; OASIG 1996; Rippingale 2003; Standish Group 2000) |
| Lack of sufficient resources | (IT Cortex 2002a; Standish Group 2000) |
| Flawed process | (Rippingale 2003) |
| Poor risk management | (Standish Group 2000; Whittaker 1999) |
| Lack of executive support | (Standish Group 2000) |
| Lack of planning | (Standish Group 2000) (IT Cortex 2002a; Kippenberger 2000; Rippingale 2003; Standish Group 2000) |

3.3 DECISION MAKING

The focus of this research is the identification and understanding of the role of factors informing pre-implementation decision making in MIS.

Decision making may be viewed as the process of selecting a course of action from among several alternatives in order to accomplish a desired result. The purpose of decision making is to direct human behavior and commitment towards a future goal. It involves committing the organization and its resources to a particular choice of course of action thought to be sufficient and capable of achieving some predetermined objective.

Managers at all levels in the organization make decisions and solve problems. In fact, decision making is the process of reducing the gap between the existing situation and the desired situation through solving problems and making use of opportunities. A decision is conclusion reached after consideration: it occurs when one option is selected, to the exclusion of others-it is rendering of judgment.

According to George F Terry, “*Decision Making is the selection based on certain criteria from two or more alternatives.*”

According to Marry Nites, “*Decision Making takes place in adopting the objectives and choosing the means and again when a change in the situation creates a necessity for adjustments.*”

According to Heinz Wehrich and Harold Koontz, “*Decision making is defined as the selection of a course of action among alternatives; it is the care of planning.*”⁹

3.3.1 WHAT ARE DECISIONS?

Decisions are situation-behaviour combinations consisting of alternatives, uncertain events and consequences.¹⁰ A decision making process can consist of the three inter-related tasks; information acquisition, evaluation and feedback or learning.¹¹ This premise informs the basis for the basic model of decision making depicted in Figure 1-2 whereby factors inform a decision process that produces outcomes.

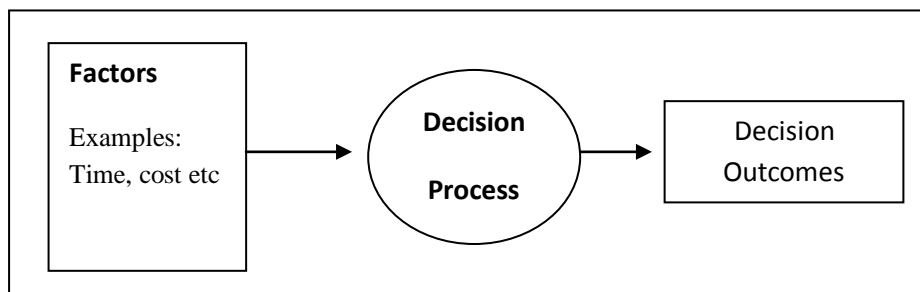


FIGURE 1-2 BASIC DECISION MAKING MODEL

Source: *Simon Administrative behaviour: A study of decision-making processes in administrative organizations, The Free Press, New York. 4. HA 2008.*

⁹ http://www.excellentguru.com/index.php?option=com_content&view=article&id=161:decision-making--meaning-and-definition&catid=41:management&Itemid=59

¹⁰ Boonstra, A 2003, 'Structure and analysis of IS decision making', *European Journal of Management Information Systems*, vol. 12, no. 3, pp. 195-209.

¹¹ Bannister, F & Remenyi, D 1999, 'Value perception in IT investment decisions', *The Electronic Journal of Management Information Systems Evaluation*, vol. 2, no. 2.

Decision makers use a number of environmental, organisational, situational, individual and content-based factors to make decisions including hard information.¹² 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.¹³ 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.¹⁴ An example of an organisational decision outcome that is pertinent to this research is the adoption of an Management Information System.

3.3.2 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.¹⁵ In judgment (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.

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.

¹² Baets, W 1992, 'Aligning Management Information Systems with business strategy', *Journal of Strategic Management Information Systems*, vol. 1, no. 4, pp. 205-213.

¹³ Hann, J & Weber, R 1996, 'Management Information Systems planning: A model and empirical tests', *Management Science*, vol. 42, no. 7, pp. 1043-1065.

¹⁴ Hann, J & Weber, R 1996, 'Management Information Systems planning: A model and empirical tests', *Management Science*, vol. 42, no. 7, pp. 1053-1065.

¹⁵ Hann, J & Weber, R 1996, 'Management Information Systems planning: A model and empirical tests', *Management Science*, vol. 42, no. 7, pp. 1054-1065.

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, and 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).¹⁶

Decision Support Systems

Because computers can process large amounts of data quickly, they were soon put to use to help make decisions. Decision Support Systems range from a simple spreadsheet to organize information graphically, to very complex programs organizing info in international companies and including artificial intelligence that can suggest alternative options and solutions.

There are various types of decision making systems depending on how many people are involved, the form of the information being processed, what type of result is required, and so on.

There are pros and cons to using computers in this way, and of course, the computer is only as good as the information that it is processing. Which means that it still comes down to the humans?¹⁷

3.4 EFFECTS ON DECISION MAKING

3.4.1 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).

¹⁶ Basi. 'Administrative decision making: a contextual analysis', Management Decision, vol. 36, no. 4, RS 1998. pp. 232-240.

¹⁷ <http://www.decision-making-confidence.com/types-of-decision-making.html>

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.¹⁸

3.4.2 UNCERTAINTY

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).¹⁹

3.5 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.

¹⁸ Vessey. The effect of information presentation on decision making: A costbenefit analysis', *Information and Management*. I 1994. pp. 103-119. Vol. 27.

¹⁹ Brindle, M 1999, 'Games decision makers play', *Management Decision*, vol. 37, no. 8, pp. 604-612.

3.5.1 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.

3.5.2 CONTEXTUAL FACTORS

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 & Halington 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:

- **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?
- **Where is the decision made?** Who makes the decision? Who owns the organisation? How does the organisational structure affect access to the decision making?
- **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?

3.5.2.1 THE WHAT DIMENSION

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.

3.5.2.2 THE WHERE DIMENSION

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.

3.5.2.3 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). 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).

3.5.3 RELATIONSHIPS BETWEEN FACTOR ACKNOWLEDGEMENT AND DECISION OUTCOMES

This lack of decision making transparency is concerning given the IS implementation failure rate. 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 longterm 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.

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.

3.6 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.

3.6.1 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 1-3). These are critical decisions: all of these decisions have a direct effect on the implementations and outcomes for the organisation.

| DECISION | DESCRIPTION |
|---------------------------------------|---|
| Governance decisions | Who will make decisions relating to the implementation and selection of the system? What power do they have? |
| Decision relating to system selection | Which system is appropriate for the organisation and specification? |
| 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? |

TABLE 1-3 PRE-IMPLEMENTATION DECISIONS

Source: Hann, J & Weber. 'Information systems planning: A model and empirical tests', *Management Science*. R 1996. pp. 1023-1035. 7.

3.6.2 DECISIONS THAT CAUSE FAILURE

Management 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 1-4) describes relationships that may exist between the decisions taken before a system is implemented and the causes of project failure

| | Factors | | | | | | | | | |
|--------------------------|---|-------------------------|------------------------------|---------------------------|-------------------------------------|------------------|-------------------------|-------------------|--------------------------|--------------------------------------|
| Decisions | 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 |
| Implementation | ✔ | | ✔ | | | ✔ | ✔ | ✔ | | |
| Time and budget | | | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | | ✔ |
| Systems selection | | ✔ | | ✔ | ✔ | | | | ✔ | ✔ |
| Specification | | ✔ | | | | ✔ | | | ✔ | |
| Initiation | | | | | | | | | | ✔ |
| Governance | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |

TABLE 1-4 DECISION AND FAILURE CAUSAL RELATIONSHIPS

Source: Hann, J & Weber. 'Information systems planning: A model and empirical tests', *Management Science*. R 1996. pp. 1023-1035. 7.

CHAPTER 4 EMPIRICAL RESULT

4.1 ORGANISATION A

The chapter describes the pre-implementation decisions surrounding a three hundred thousand dollar reimplementation 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 MIS 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 factors that were nominated as having effects on MIS decisions within the organisation.

4.1.2 OVERVIEW

The CEO of organisation A has been CEO and owner of the firm since 1996 when he opened up a new car dealership in Prague, Czech Republic. Organisation A is selling new cars and repairing used cars. They also offer their customers leasing and supplying of spare parts. The organisation employs approximately 150 full-time employees; however it maintains up to another two hundred contract staff.

4.1.2.1 INTERVIEWEES

Three 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 and a Business Systems Project Manager. Two of the interviews were conducted face-to-face and one 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 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.

4.1.3 SPECIFIC PROJECTS

One contemporaneous IS projects within the organisation is discussed during interviews. The project concerned the implementation of a business intelligence suite for the organisation's enterprise resource planning (ERP) system. The discussions relating to the

system formed a mesh of experiences and factors that related to how IS decision making occurred within the organisation.

4.1.3.1 DECISION FACTORS

This section examines the factors nominated as having directly affected the decision makers' decisions in the two projects. A combination of relevant (contextual) and factors of information decision 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.

4.1.3.1.1 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 Czech 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.

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.

4.1.3.2 DECISION OUTCOMES

This section examines the outcomes from the decisions taken in the two projects.

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.

4.1.3.2.1 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.

Organisationally, 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'.

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.

4.2 ORGANISATION B

4.2.2 OVERVIEW

Organisation B is a firm located in Czech Republic offers their customers heavy machines mainly for agricultural purposes, financing, various workshop services and retailing of spare parts and exporting insecticides to Nigeria. The customers of Organisation B are mainly located in Nigeria and consist of various categories of customers such as agriculture and industry.

4.2.2.1 INTERVIEWEES

Two interviews were conducted within the department regarding the provision of a five hundred thousand Czech koruna 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) and the Section Head of Infrastructure and Operations (hereafter the Section Head).

The CIO had over seven 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 in Nigeria. 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.

4.2.3 DECISION FACTORS

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]’.

4.2.4 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.

CHAPTER 5 CROSS-CASE ANALYSIS

5.1 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:

- *What are the factors of information used by decision makers when making MIS decisions and how do these factors of information affect people making the decisions and decision making?*

Ten separate informational factors were identified as affecting IS pre-implementation decisions as detailed in Appendix 2 (see page 42). These 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’.

5.1.1 FACTOR TANGIBILITY

A final consideration in the examination of the information used by decision makers was the tangibility characteristics of the factors. Two of the ten informational factors were classed as intangible, while five were classified as tangible. Two 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.

5.2 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:

- *What are the factors of context used by decision makers when making MIS decisions and how do these factors of information affect people making the decisions and decision making?*

Ten separate contextual factors were identified as affecting IS pre-implementation decisions as detailed in Appendix 3 (see page 43). It should be noted that although separate, many factors were interconnected or acted in concert. Appendix 3 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. Key factors and groups of factors are examined in the following sections.

5.2.1 FACTOR TANGIBILITY

A final consideration in the examination of the contextual elements that influenced decision makers was the tangibility characteristics of the factors. One of the contextual factors were classed as intangible, while two were classified as tangible. The most influential contextual factors were tangible.

5.3 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. To address the purpose of the thesis and conclusions. Findings addressing the primary research question:

When making MIS decisions, what information and factors that affect people making the 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.

5.3.1 QUESTION SUMMARY

Twenty were identified as having effects on decision makers. These consisted of ten informational and ten contextual factors (see Appendix 2, page 42 and Appendix 3, and page 43). Five broad thematic factor groups were identified: confidence, opinions, option, organization and perceptions

CHAPTER 6 DISCUSSION AND CONCLUSION

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 organizational outcomes. This argument was confirmed from the research findings.

Twenty factors of information and relevant factors (contextual) were identified in this thesis as having effects on management information system in decision making. These factors fall into five groups, they are decision process, confidence, opinions, option attributes and organisation. . 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 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 two different organizations. The common threat was that each decision was critical to the organisation's operations and had long-term effects. This thesis

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 way to addressing the problem.

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APPENDIX 1 INTERVIEW SCRIPT

A student of Czech University of Life Sciences, Prague, Czech Republic writing a Bachelor thesis on the use of management information system in an organisation. The objective of my research is to investigate the factors affecting decision makers and outcomes.

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 organization

1. What are your duties (what do you do)?
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 would you describe as your area or areas of expertise?
6. To whom do you report to?
7. Describe the purpose of your organisation (e.g. education, consulting, manufacturing etc.)
8. Who do you supervise directly?

Decision Processes

9. 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?
10. Who else was involved with the decision-making process?
11. Would you characterise the decision process as “formal” and structured or informal?
12. What did you think about the decision-making process? How could it have been improved?

Factors and Information (Decision Maker)

13. What were the sources of information you used in the decision-making process?
14. What facts, information or opinions do you think affected your decision?
15. Were there any political, cultural or historical influences that affected your decision? If so, what were they?
16. Were there any other influences that you feel affected your decision?

17. Given what we have discussed, could you rank all the factors that affected the decision in order of importance?

Factors and Information (Information Provider)

18. What were the sources of information you used to inform the decision-making process?
19. What facts, information or opinions do you think affected the decision makers?
20. Do you think that there were any political, cultural or historical influences that affected the decision? If so, what were they?

Decision Outcomes

21. Have the initial decisions regarding the IS project affected other decisions?
22. Would you categorise the initial decisions as having good or bad outcomes for the IS project?
23. Would you categorise the initial decisions as having good or bad outcomes for the organisation?
24. (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?

APPENDIX 2 DECISION MAKING FACTORS (INFORMATION)

This appendix contains a table of decision making factors (information) found in this research.

| Theme | Factor | Organisation A | | | Organisation B | | |
|--------------|--|----------------|----------|----------------|----------------|----------|----------------|
| | | Tangibility | Decision | Outcome effect | Tangibility | Decision | Outcome effect |
| Option | Compliance with technical standards | T | M | | | | |
| Option | Delivery date or time | T | M | | | | |
| Option | Risk | T | L | | I | L | |
| Confidence | Confidence in options and process | I | H | + | I | L | + |
| Opinions | External opinions | I/T | H | - | | | |
| Option | Functionality (software and hardware features) | T | M | | T | H | |
| Perceptions | Gut feeling | I | H | | I | H | |
| Opinions | Internal opinions | I/T | H | + | I/T | H | + |
| Organisation | Organisational Requirement | T | H | | T | H | |
| Perceptions | Alignment, fit and suitability | | | | I | H | + |

Source: *Own Work*

APPENDIX 3 RELEVANT FACTORS THAT AFFECT DECISION

This appendix contains a table of contextual factors found in this research.

| Theme | Factor | Organisation A | | | Organisation B | | |
|------------------|--|----------------|----------|----------------|----------------|----------|----------------|
| | | Tangibility | Decision | Outcome effect | Tangibility | Decision | Outcome effect |
| Confidence | Lack of confidence in decision makers | | | | | | |
| Organisation | Unclear organisational objectives from project | | | | | | |
| Confidence | Confidence or trust between IS and business units | | | | I | M | + |
| Confidence | Poor communication and trust between decision makers | | | | | | |
| Confidence | Previous record of IS failure | | | | | | |
| Decision process | Lack of organisational confidence in process | | | | | | |
| Organisation | External relationships | | | | T | M | + |
| Decision process | Inexperienced or uninformed decision makers | I | L | - | | | |
| Decision process | Use of external information sources | T | L | | T | L | |
| Decision process | Use of internal information sources | T | L | | T | H | + |

Source: *Own Work*