

# A Study of Information Requirement Determination Process of an Executive Information System

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## INTRODUCTION

An executive information system (EIS) provides senior management with easy access to information relevant to their needs. It can spread horizontally across and vertically down to other organizational managers and provide three major types of benefits: information, management support, and organizational support (Salmeron, 2002). According to Salmeron, one key EIS success factor is the fulfillment of users' information needs. However, the user information requirements determination (IRD) process during the implementation of an EIS remains a problematic exercise for most organizations (Walter, Jiang, & Klein, 2003). This is because IRD is the least understood and least formalized yet most critical phase of the information systems development (ISD) process. This phase is so crucial that many information systems researchers argue that IRD is the single most important stage during an EIS project development process, and if the IRD is inaccurate and incomplete, the resultant system will also be inaccurate and incomplete.

Hence, understanding the issues that influence the IRD process of EIS is of critical importance to organizations (Poon & Wagner, 2001). However, little is known about the issues that influence IRD processes during the implementation of an EIS project (Khalil, 2005). Therefore, this article aims to examine key issues surrounding the IRD process during the implementation of an EIS project in a large Australian public-sector organization. The article first reviews relevant literature with respect to IRD and EIS. Key findings and issues identified from the case study are also presented. The article examines these findings and issues in light of these organizations' IRD practices, and concludes by providing some lessons for EIS project implementation.

## BACKGROUND

IRD is a critical phase of ISD. IRD is primarily concerned with specific applications such as EIS. IRD has generated a lot of interest and debate among researchers and practitioners as a potential means for improving the success rates of ISD projects such as EIS (Havelka, 2002; Wu & Shen, 2006). The IRD process, which Browne and Ramesh (2002, p. 625) defined as "a set of activities used by a systems analyst when assessing the functionality required in a proposed system," has become increasingly important in obtaining the correct and complete set of user requirements.

A number of tools and techniques have been proposed to support the IRD process during the EIS project: prototyping, joint application development (JAD), rapid application development (RAD), data flow diagrams (DFDs), and entity relationship diagrams (ERDs; Duggan & Thachenkary, 2004; Spina & Rolando, 2002). However, despite the existence of all these techniques and tools, the history of ISD has been littered with numerous reports of the complete failure of EIS projects (Khalil, 2005). The common causes of these failures stem largely from difficulties in dealing with the information requirements (Browne & Ramesh, 2002; Davis, 1987). In many cases, budget blowouts and missed deadlines occur. Too often, initial design and programming is followed by a reassessment of needs, redesign, and then more programming (Urquhart, 2001). Many EIS project failures have little to do with technical or programming issues. The source of many of these problems lies with one or a combination of the following major factors: incomplete and/or inaccurate requirement specifications, lack of user involvement, lack of flexibility of computer-based information systems, poor communication, different worldviews of the systems analysts, and other factors

(Guinan, Coopridge, & Faraj, 1998; Kirsch & Haney, 2006). Each of these will be discussed briefly in the subsections that follow.

### **Incomplete and/or Inaccurate Requirements Specifications**

This can often lead an organization to address the wrong problem or identify incorrect information needs. Dissatisfaction of the stakeholders with their IS derives from the problem of specifications not being stated accurately and/or completely (Davidson, 2002; Khalil, 2005). This can also arise from users having totally unrealistic expectations of the final EIS. Therefore, incomplete and inaccurate requirements specifications can often result in identifying the wrong information needs or addressing the incorrect IRD problem. This may ultimately lead to EIS project failures.

According to Browne and Ramesh (2002), the following challenges should be recognized by both analysts and users when they are dealing among themselves:

- There can never be a complete, correct set of user information requirements.
- Requirements are not stable over time, but are in a constant process of evolution.
- The facilitation skills of systems analysts are crucial to the effective management of the IRD process.
- Systems analysts work in highly political contexts.

### **Lack of User Involvement**

One of the major factors contributing to the failures of EIS projects is the lack of user involvement. By failing to be involved during the system development stages, users might feel frustrated and disillusioned when they perceive new technologies such as EIS as the threatening creations of outsiders (Robertson & Robertson, 1999). This usually results in resistance and conflicts between the project sponsors, the systems analysts, and the users (Davidson, 2002).

Lack of user involvement often results in distrust between the users, the systems analysts, and the project sponsors. Users feel unable to specify what they want because they do not know what is possible while the systems analysts try to explain what is possible but describe it in ways not understood by the users

(Browne & Rogich, 2001; I. Wu & Shen, 2006). This usually not only reduces job satisfaction on both sides but also leads to less-than-adequate systems design (Alvarez, 2002).

### **Lack of Flexibility of Computer-Based Information Systems**

Computer-based information systems (e.g., EIS) often lack the flexibility to meet changing user information requirements and have little interaction with the manual systems (Salmeron, 2002; I. Wu & Shen, 2006). These are often due to the way computers have to be programmed, in which any change that involves a change to the program requires a detailed sequence of steps to be taken, which can be time consuming and disruptive. Some changes, even changes that appear trivial to the nonexpert user, cannot be incorporated in the system without a substantial redesign of the computerized parts of the system (Lauesen & Vinter, 2001; Sutcliffe, 2000). Moreover, since the organizations and the people within them are dynamic and constantly changing all the time, a computer-based information system that takes too long to finish will not be able to meet users' needs and hence will become a major stumbling block to the success of the EIS.

### **Poor Communication**

Poor communication between users and analysts is also a major factor contributing to the failure of EIS (Urquhart, 2001). Communication skills of systems analysts have a significant impact on successful and complete information requirements of EIS. Some of the most important reasons for communication difficulties are as follows (Douglas, 2003; Guinan et al., 1998; Urquhart):

- The different perspectives of the different stakeholders involved in a system study
- Uncertainty on the part of the users of the impact the final system will have on their individual roles in the organization
- The observation that the user operates with informal systems and that the formal procedure of the existing systems has been overtaken by less formal, unauthorized procedures
- The problem facing both users and systems analysts that new systems almost certainly include technological innovations

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