

# Chapter 11

## Strategic Development of a Decision Making Support System in a Public R&D Center

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### ABSTRACT

*Decision making in new technologies is a crucial activity to raise competitiveness, especially for technology organizations. The decision-making process requires the use of information technology tools, since the information amount is large and requires reliable methods for collecting, accessing, storing, processing, distributing, and evaluating, in order to provide reliable information to decision makers. The strategy of an organization must take into account the integration of this aspect with other organizational functions. This paper presents a proposal to integrate new elements into the IT strategy, considering the interactions with other organizational functions, defining an implementation and transition plan that takes into account the organization dynamics, which has limited resources and, therefore, requires a gradual and long term transition plan. This paper refers as case study to a Mexican Public R&D Center, which has re-engineered its operating model with a systems approach.*

### INTRODUCTION

The information system integration is an important topic in the strategic agenda of organizations. The term Enterprise Information System (EIS) refers to an information system that facilitates business processes and functionalities on an enterprise level

(i.e., spanning across the enterprise) (Jukic, Jukic, & Velasco, 2009). In this regard being the key to ensure that computer systems are suitable and adapted to the organizational strategy, ensuring that when the latter changes, information systems enable and adapt, rather than becoming an obstacle for change (Cummins, 2002).

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One of the main challenges for the integration of computer systems is that, usually, organizations integrate isolated information systems (Sharum & Sage, 2002), since “organizations often make these decisions without formal analysis of existing systems and processes or without the clear understanding of the new system’s details” (Jukic, Jukic, & Velasco, 2009; OASIG, 1996). An approach which integrates organizational and technical change is perhaps missing in most organizations (Sedmak, 2010).

One of the objectives of any organization is to adapt to its environment in an optimum sense, and to periodically reassess its strategy of adaptation as the environment changes (Kumar & Markeset, 2007). With this objective in mind, the organization needs to have methods and schemes in order to obtain, organize, process and analyze information about its operation and its environment (Maguire, Ojiako, & Robson, 2009) to gain a deeper understanding of their organizations and improve the decision-making process of users (Rockart, 1979). It is maybe surprising to note that “80% of the information needed to develop business intelligence already exists within organizations” (Rouach & Santi, 2001). However, Top managers of major corporations are frustrated by their information systems. They have difficulty getting information about how the business is running, as well as difficulty getting information to analyze the causes of major problems in order to develop solutions (Cummins, 2002).

In this paper, we propose a theoretical alternative to strengthen the alignment between organizational strategy and Information Systems development, by defining a development strategy based on organizational architecture. Enterprise architectures, and frameworks which are offered as guidance for the construction of enterprise architectures, are not just theoretical constructs documented in the literature. They are in fact becoming commonly accepted in practice in both industrial and governmental institutions (Sharum

& Sage, 2002). Enterprise architecting refers not just to the architecting performed at the Chief Information Officer’s level, but rather the larger enterprise context encompassing major program architectures, and down to the architecting of individual systems (Sharum & Sage, 2002).

One of the main objectives to identify and define the organizational architecture as the basis for the development of information systems is to facilitate the interconnection of the various organizational elements. Communication and interconnection of organizational elements promotes synergy and collective intelligence. Each individual has some knowledge, both specific and global. This knowledge expands synergistically when shared in a collaborative environment (Baquero & Hernandez, 2008). It is also important to emphasize that collaboration and interdisciplinary are key to innovation, as they pose new methodological and conceptual situations, forcing a process of continual invention and experimentation (García, 2006).

This paper also considers the case of a Mexican Public Research Center, which held a reengineering of its operating model with a systems approach (Martínez-Berumen, Baquero-Herrera, & Lizardi-Nieto, 2010). We propose such a systems-oriented operation model as a basis for the strategic development of Information Systems.

This paper deals specifically with the development of a Decision Making Support System (DMSS) to support decision making in new technologies.

One aspect considered in the proposed methodology is that the reference organization has several information systems, many of which operate in a disjointed way (Baquero & Hernández, 2008). In addition, several inputs required for the methodology to support decision making on new technologies are obtained manually. Also, it is noted that the organization has limited resources for the acquisition or development of new information systems, so that the development and

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