

## Chapter 3.2

# Fuzzy Modelling for Integrated Strategic Planning for Information Systems and Business Process Design

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### ABSTRACT

Strategic Information Systems Planning (SISP) has been a continuing top concern for IS/IT management, since the mid 1980's. Responding to the increasing interest in SISP, researchers have developed a large number of SISP methodologies and models. However, when organisations embark on planning for their information systems, they face difficulties and usually fail to gain the expected benefits. Strategic alignment and the

identification of the business areas where the IT contribution is strategically important for the organisation are the most difficult problems in SISP. None of the existing SISP methodologies and models offers a complete solution. The approach presented in this chapter, utilises a Fuzzy Cognitive Map in order to align strategic objectives with IS opportunities that exist at the level of business processes. This chapter exemplifies fuzzy cognitive mapping in SISP, and illustrates how the strategic alignment between the business and IT domains can be realised.

DOI: 10.4018/978-1-60960-587-2.ch302

## **INTRODUCTION TO STRATEGIC INFORMATION SYSTEMS PLANNING**

Organisations experienced radical changes in their business and technological environment especially, during the 80's and 90's. The globalisation of the market and increased competition, in conjunction with a deep economic recession, and changes to the social and economic characteristics of the consumers, exert their pressure on companies. The struggle for further development, or even for survival in such an environment, has become increasingly difficult. However, during the same period an increasing number of research studies (Earl, 1989; O'Connor, 1993; Remenyi, 1991; Ward et. al., 1990) described successful IT initiatives that led companies to new ways of competing, and analysed the factors which led organisations to strategic planning for their IS. Briefly, the driving forces behind SISP are:

- Information technology is critical and strategically important to many organisations.
- The relative high growth in information systems budgets compared to that of other functions in organisations.
- Information technology is needed by our economic environment.
- Information technology is rapidly changing.
- Information technology infrastructure and architecture is critical for information systems integrity.
- Information technology involves many stakeholders.
- Top management support and user participation in IT-related decisions are needed.

It is high time that organisations begin to realise the potential of IT as the driving force to lead businesses out of the crisis and to improve organisational competitive performance. As a result, strategic planning for IS/IT has become a key activity which systematically addresses the

IT issues in organisations, and can identify IT applications which exploit opportunities or counterthreats with substantial importance to business. Relevant literature argues that companies can not be competitive if their information systems strategies are not aligned with the business strategies (Avison et al. 2004).

In (Lederer and Sethi, 1988, 1991) a dichotomous definition of Strategic Information Systems Planning (SISP) is provided. On one side of the dichotomy, SISP is a process of identifying computer-based applications that support certain business activities, strategic plans and objectives. On the other side of the dichotomy, SISP is a process of identifying computer-based applications which are characterised by their high potential to lead the organisation to competitive advantage. It is a process which results in innovative IT applications that may alter the competitive scene in an industrial sector, spawn new products, raise entry barriers to new competitors, etc. In both the above adopted views, SISP also covers the definition of the technological infrastructure, i.e. databases, communications, and other systems which are required for the implementation of the identified IT applications.

It is argued however (Earl, 1989), that there exists a common confusion between the terminology which refers to information systems, information technology and their planning. Earl (1989) gives three definitions that delineate the concepts, and are adopted in this research work. These definitions are presented below:

*Information Systems (IS) Strategy* is concerned primarily with aligning IS development with business needs and with identifying and exploiting competitive advantage opportunities from IT. IS strategy deals with *what* to do with the technology.

*Information Technology (IT) Strategy* is concerned primarily with technology policies, such as the specification of analysis and development methods, security levels, technical standards, vendor policies, etc. The IT strategy is the architecture that drives, shapes and controls the IT infrastruc-

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