Chapter 3.4
Supporting Executive Intelligence Activities with Agent–Based Executive Information Systems

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ABSTRACT

This chapter examines the theoretical underpinning for supporting executive intelligence activities and reviews conventional studies of executive information systems (EIS) over the last two decades in responding to the current executives' information processing needs and the current Internet era. The reviews suggest the need for designing advanced EIS that are capable of responding and adapting to executive information. This chapter recognizes the necessity of revitalizing EIS with advances in intelligent technologies and Web-based technologies. Empirical studies were conducted to elucidate executives' desires and perceptions of the prospect of agent-based technologies for supporting executive intelligence activities in the more integrated and distributed environment of the Internet. Based on the insights gained from empirical studies, this chapter concludes by presenting a three-level agent-based EIS design model that comprises a "usability-adaptability-intelligence" trichotomy for supporting executive intelligence activities.

INTRODUCTION

It is widely recognized that there is an increasing complexity and dynamism of operational and strategic information in electronic and distributed environments. Executives are now seeking assistance for continuous, self-reactive and self-adaptive approaches to acquiring, synthesizing, and interpreting information for intelligence with a view to determining the course of action that is executive intelligence activities. Executive information systems (EIS) originally emerged as computer-based tools to provide executives with easy access to strategic information and to support and enhance their information processing activities. EIS were popularized in the 1990s but EIS study has not advanced to a great extent in either research or practice in recent years. Conventional EIS studies have established a range of views and guidelines for EIS design and development, but the guidelines underpinned by extant research have failed to develop robust and intelligent EIS.

The most common deficiency of conventional EIS is their inflexibility, relying on processes designed for static performance monitoring and control and predetermined information needs. The emergence of the intelligent software agent, as a concept and a technology, provides the prospect of advanced solutions for supporting executive's information processing activities in the more integrated and distributed environment of the Internet. Nevertheless, executives' desires and perceptions of agent-based support must be elucidated in order to develop systems that are likely to be considered valuable in practice and stand the test of time when implemented.

The objectives of this chapter are threefold. First, the chapter examines the theoretical underpinning for supporting executive intelligence activities and the need for designing advanced EIS that are capable of responding and adapting to executive information. Second, the chapter reviews conventional studies of EIS and confirms the need for revitalizing EIS with emerging technologies. Third, the chapter proposes a model for designing an advanced EIS with agent-based support. This chapter starts with a review of theories and debates on understanding the need for supporting executive intelligence activities. It then provides a review of the emergence of executive information systems (EIS) in responding to the executives' information processing needs over the last two decades and identifies the problems with conventional EIS in the current Internet era. It recognizses the necessity of revitalizing EIS with advances in intelligent technologies and Web-based technologies. This chapter also discusses the current development and applications of intelligent technologies and the potential contributions of intelligent software agents could make to revitalize conventional EIS.

Based on the insights gained from empirical studies, this chapter concludes by presenting a three-level agent-based EIS design model that comprises a "usability-adaptability-intelligence" trichotomy for supporting executive intelligence activities. The emphasis of this agent-based EIS design model is an intelligent and executive-centered system that focuses on these three dimensions.

THEORETICAL UNDERPINNING OF EIS DEVELOPMENT

As the business environment becomes more volatile and competitive the appropriate handling of information and knowledge has become a distinct core competence. The capability to know itself, know its "enemies," and know its business environment significantly affects a company's success or failure. The challenge is that organizations and their environments are systems that continually present a variety of disturbances through signals and messages that senior executives should attend to (Auster & Choo, 1994; Daft, Sormunen, & Parks, 1988). As a result, senior executives are facing increasing complexity and variety in operational and strategic issues.

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