EIS

EXECUTIVE INFORMATION SYSTEM

Development Practices and Usage

经理信息系统开发及应用

魏 东 著

教育科学出版社

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Dong WEI

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经理信息系统开发及应用

魏 东

For Maomao

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ABSTRACT

In this book, current Executive Information System (EIS) development practices and usage have been intensively investigated through literature review. EIS architecture, development technologies and frameworks, critical success factors (CSFs) have been introduced and thoroughly illustrated to reflect the current EIS development practices. Current EIS usage has been investigated from three perspectives, EIS functions, EIS diffusion and usage differences between public and private sectors.

Eight critical issues have been identified and briefly described. They include cultural, social, organizational, economic, technological, political, psychological, and security issues, which together contribute to the ultimate EIS success. An EIS life cycle was modified from the framework introduced by Hasan and Gould (1996). The revised life cycle is composed of four stages as Inception, Elaboration, Development and Usage. The life cycle was applied to crosscheck with the critical issues to reveal certain issues, which EIS developers and practitioners should pay more attention to in various stages in order to achieve EIS success more efficiently and effectively. The eight critical issues are not meant to be complete and perfect, further research is required to improve and validate those issues. In addition, the EIS life cycle with critical issues raised in various stages should be further researched and validated.

序 I

魏东，你的论文终于要出版了—2004 年初，从澳大利亚顺利毕业回国后就计划着出版的论文经过两年的时间终于要出版了。深深地为你感到高兴。当你猛然提出由我来给你的论文写序时，我的心不禁咯噔了一下，深怕有辱使命，平实单调的词藻会令人失望。可仔细一想，却又干脆的答应了。还记得我说"好，我来写"时兴奋肯定的笑容吗？因为我突然意识到，虽然自己不是什么学术大师，我的序也无法为你的优秀论文吸引来更多的关注，但从你论文选题到完成，再到以优异成绩获得优秀毕业证(Graduation with Distinction)，其间种种，我都在你的身边与你共同经历，深感你治学的严谨、思维的缜密、语言的驾驭能力，以及所获成绩的来之不易。我甚至比我们共同的导师还要早的认真阅读你每章的初稿，然后与你一起讨论 — 无论在路上，还是在饭桌上。你获得灵感那一霎那的容颜喜悦，你向我讲述新的想法时的烁烁眼神，你思考以求突破时的眉头紧锁……这些至今回忆起来还历历在目。所以还有谁比我更了解这一切呢？由我来写这篇序仿佛成了理所当然，就像你能以两届学生中最优异的成绩获得卧龙岗市政府奖金那样理所当然。那是对你 2003 年一整年从未间断思索和学习的肯定和见证，而我的序也正是对这一切的见证。

记得当时接到这个题目时，我们在 ScienceDirect，ProQuest 5000 等国际数据库里搜索相关文献，发现几乎很少有来自中国的研究，其后又在各大搜索引擎上进行了搜索，所得的中文资料也是寥寥无几，仅有的几个链接也是些单薄的介绍，这使我们既好奇又兴奋，好奇的是在国外研究几十年、有相当研究成果的领

域为何在国内尚得不到重视，兴奋的是倘若我们的文章能够对这一现象有所贡献那该多好。而今，你的文章将使那份曾经的兴奋即将变为现实。我想如果我们的导师 Ditsa 知道后一定会为你高兴的，就像当年因为看到你的研究成果而高兴一样。

魏东，你的论文我是认真读过许多遍的。从当前该领域的研究来看，这可能算是国内第一本研究经理信息系统(EIS)的英文专著，并且具有几大特点，值得国内外相关研究人员和爱好者像我这样来仔细阅读。首先，该文通过大量深入的阅读分析 EIS 以及其它相关的信息系统的著作和文章，全面的、系统的、结构紧凑的整合了 EIS 的发展和应用情况，突出了 EIS 有别于其他信息系统的重要特点。这种有机的整合对于读者宏观掌握 EIS 理论非常有帮助。其次，也是最为关键的是，该文突破了许多人对于某种研究的回顾是不可能谈上创新的想法，在前人理论的基础上建造了一套全面完整的 EIS 开发模型理论。该模型对于 EIS 的建立具有非常系统的指导作用。记得导师也曾提出希望你可以参加当时的相关学术会议，将你的所得与众学者分享。只是因为我们迫切的回到祖国而使得此事没有成形。我相信如果接受导师的邀请继续留澳攻读博士，你的这一创新会得到进一步的完善。另外，在语言上，可以肯定的说你对英文专业写作的良好把握也将使得本文成为国内少有的 EIS 研究方面的范文。我相信有幸读到你这篇论文的读者一定会有所收获。

魏东，现在是凌晨 3 点 34 分。在你提出由我来给你的论文写序后的两天半用来思考，第三天晚上写成。用了这些时间，不是因为我在偷闲，是因要为这篇文章写序而在心中默默的回味你我一起努力拼搏的美好记忆，在回味中认真的整理出了这白纸上的每字每句—关于在澳大利亚的一年的学习与生活掠影。而你的这部优秀论文则是那一段艰辛却又无限美好生活的重要

组成部分，我为它的出版感到无比高兴。所以这篇序不仅包含着我对本书的认识，更包含了对那段日子的深情。形式上叫做序，大概内容上更是一段内心独白。来，让我们拥抱，为了你正式出版的这第一部个人著述，为了你未来更大的辉煌。

璟珉

2006.06.26 晨于家中

序 II

I have the pleasure and confidence to write on Mr Dong Wei who I personally taught and supervised at the postgraduate level as part of the fulfillment of the requirements for the award of the Master of Information Systems degree at this University.

I found Mr Dong Wei to be very hardworking, intelligent, responsible and devoted to his work. Mr Wei has a very high level of academic standard. He approached his academic work with such diligence, critical and analytical mind resulting into a very high quality academic work and standard. In addition to these qualities, Mr Wei is a person of cheerful disposition and possessed a very good sense of humour. He has a very good communication skill and works very well in a team environment as well as individually.

In the two postgraduate level subjects(Strategic Information Systems Management and Management of Systems Development) which I lectured and tutored Mr Wei, he was in the top 5 percent of the class. In the Information Systems project in which I supervised Mr Wei, I found him to be very critical, analytical and able to work independently to achieve the desire goal. His final project report was excellent and worth publishing.

Dr George Ditsa
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CHAPTER 1. INTRODUCTION

During the last two decades, Executive Information System (EIS), which is primarily designed to support decision making for senior executives, has been substantially developed and evolved into a powerful weapon to promote efficient enterprise resource allocation, effective strategic planning, decision making and other activities associated to the management process. This is aimed at keeping organizations always on the edge in the fierce competition of international marketplace.

Nowadays, as the pyramid of most modern organizations collapse and the management hierarchy goes flat, the use of the EIS has changed dramatically. From the technological perspective, the proliferations of PCs and advances in powerful Data Warehousing and Mining capabilities also enable the drastic change in the way EIS is designed, developed, adopted and utilized. Various studies concerning the development practices and usage of EIS have been conducted aiming to cope with these changes, which are supposed to provide proper guidance and directions to EIS users, practitioners and developers. How ever, most studies are concerned with a specific aspect of EIS practices and usage only due to difficulties in data collection, restricted size of demography, limitation of the research methodologies etc.

This book is aimed at investigating the current development practices and usages from various perspectives through literature review concerning both issues of EIS in the hope to provide users,

developers and practitioners a wider view of current development practices and usage of EIS, which might enable a comprehensive understanding, better development and utilization of future EIS.

In order to achieve this objective, chapter 2 will provide some background information for users who are not familiar with EIS to underpin their understanding of the EIS definitions, characteristics and some history.

Chapter 3 will illustrate the nature of executives' work and what kind of information they eagerly need. Both the complexity of executives' work and the diversity of executive information rationalize the motivation to develop a better solution for executives to improve their working performance and reduce their conventional reliance on subordinates' reports, meetings and conferences. EIS emerges not as a displacement of traditional way of gathering information but rather an incremental tool to enable executives with easier access to internal and external information repositories, better communication and more powerful analysis and prediction capabilities.

In Chapter 4, it will first depict the EIS architecture, which provides a big picture of how EIS is organized and what are its major components. Then some key technologies in EIS development are introduced, from which practitioners and developers can perform their selections based on their own preferences. Two commonly cited EIS development frameworks are elaborated to assist EIS practitioners and developers to choose and follow during their EIS design and implementation. At the end of the chapter 4, some critical success factors to EIS development are illustrated, therefore

great attention should be paid on them to ensure the successful EIS development.

Chapter 5 will go through various perspectives of EIS usage which are categorized as threefold. Firstly, the usage of EIS will be illustrated from the point of view of EIS functions. These functions include information easy access, communication, problem solving and performance monitoring. Three different user patterns will be identified and illustrated based on their frequency of use of the four EIS functions. Secondly, the usage of EIS in various levels and divisions of a contemporary organization will be elaborated. It is normally referred to EIS diffusion. Thirdly, the usage of EIS in public sector will be illustrated to reveal sector differences, particularly differences between public and private sectors.

In chapter 6, a conclusion will be drawn to summarize the key findings and thoughts nurtured from the literature review. Eight critical issues to EIS successful implementation and acceptance will be summarized. An EIS life cycle model will be introduced to crosscheck with the eight critical issues, which should be raised and weighed differently in various stages of the EIS life cycle, to ensure effective EIS implementation and its ultimate success.

CHAPTER 2. A GLANCE ON EIS

EIS is a special type of Decision Support Systems (DSS) that is aimed at facilitating the scan and analysis of both internal and external information critical to the successful operation of the overall organization. It expedites the strategic decision-making process of senior executives by providing them an arsenal of powerful visualized tools. More specifically, EIS is utilized to facilitate strategic management (see figure 2-1) and it provides top executives almost immediately an overall picture not only of the status of operations and performances of the organization itself but also of the external environmental factors which have significant impact to the organization such as competitors, customers, suppliers, government regulations and deregulations (Marakas 1999).

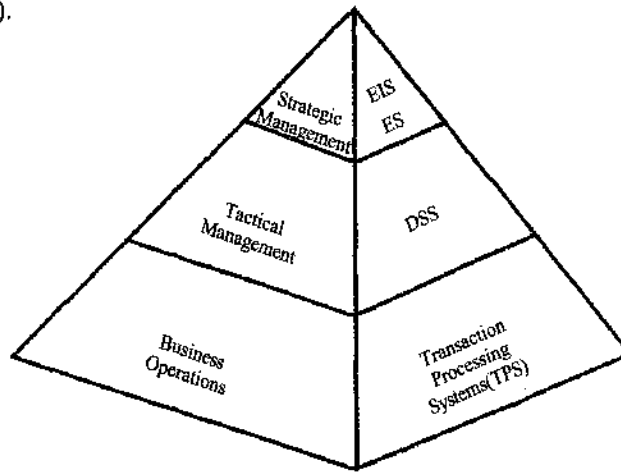

Figure 2-1. EIS in Organizations (Post and Anderson 2000)

One vivid description compares EIS with an airplane cockpit to elaborate what EIS do and what it concerns.

A modern airplane cockpit is an effective model for an EIS. Key indicators are monitored constantly. When an indicator, such as elevation, move outside an acceptable range, a warning sounds. The pilot can take immediate action to correct the problem. Hundreds of indicators are monitored, yet most of them become visible to the pilot only when a problem is apparent. A smaller number, such as speed, altitude, elevation, and course are constantly visible, because they show just how well the flight is going. These essential indicators are the ones that the pilot must watch constantly in order to "stay on course." An EIS system has a similar hierarchy. Each executive must watch a small number of key indicators to be certain that his or her segment of the enterprise is "on course." In addition, there are hundreds, or even thousands, of additional indicators that are important, but that need to become visible only when their values go outside an acceptable range' (Hoven 1996).

The above description may help you to gain a brief but vivid understanding of EIS. In order to consolidate your understanding in terms of formal concepts of EIS, in the rest of this chapter, the definitions, characteristics and historical development of EIS will be elaborated to aid you to underpin a thorough and comprehensive understanding of what exactly is EIS.

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