Chapter 25
Directed Basic Research in Enterprise Resource Planning (ERP) Systems

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ABSTRACT

Enterprise Resource Planning (ERP) covers the techniques and concepts employed for the integrated management of businesses as a whole, from the viewpoint of the effective use of management resources, to improve the efficiency of an enterprise. One way of looking at ERP is as a combination of business processes and information technology. The objective of this chapter is to highlight the research challenges in ERP projects from the viewpoint of software engineering and draw round the solutions in hand. This chapter on the directed basic research in ERP systems gives us two outputs: (1) A comprehensive framework presenting the current research problems in the ERP systems from the viewpoint of software engineering and (2) The channel to solve these problems. The outcome is a high quality, reliable and complete ERP software solution.

INTRODUCTION

The practice of the implementation of ERP systems is flooded with stories of devastating implementation. It seems to be an accepted fact that ERP implementations never are on time, within the budget and never meet the desired business outcome. A number of surveys support this fact, and at the same time, we see an increasing attention to the extended implementation process, the so-called "second wave". Going live is not the end of the ERP journey and most companies actually report a decline from baseline performance during the initial stage after going live. Enterprise Resource Planning Software or ERP does not live up to its acronym. Forget about planning—it does not do much of that—and forget about resource, a throwaway term. But remember the enterprise part. This is ERP's true ambition. It attempts to integrate all departments and functions across a company onto

a single computer system that can serve all those different departments' particular needs. That is a tall order, building a single software program that serves the needs of people in finance as well as answers the needs of the people in human resources and in the warehouse. Each of those departments typically has its own computer system optimized for the particular ways that the department does its work. But ERP combines them all together into a single, integrated software program that runs off a single database so that the various departments can more easily share information and communicate with one another. That integrated approach can have a tremendous payback if companies install the correct software. Enterprise Resource Planning (ERP) covers the techniques and concepts employed for the integrated management of businesses as a whole, from the viewpoint of the effective use of management resources, to improve the efficiency of an enterprise. ERP packages are integrated software packages that support these ERP concepts. In the beginning, they were targeted at the manufacturing industry, and consisted mainly of functions for planning and managing core businesses such as sales management, production management, accounting and financial affairs, etc. However, in recent years, adaptation not only to the manufacturing industry, but also to diverse types of industry, has become possible and the expansion of implementation and use has been progressing on a global level.

ERP software standardizes an enterprise's business processes and data. The software converts transactional data into useful information and collates the data so that they can be analyzed. In this way, all of the collected transactional data become information that companies can use to support business decisions. The perspective that ERP software is simply a means of cutting cost is still prevalent. As a result, organizational resistance to ERP implementation has often been high, and not all ERP implementation programs delivered the promised enterprise improvements.

BACKGROUND

Software Engineering is a discipline that integrates the process, methods and tools that are required for the development of the software. An Enterprise Resource Planning (ERP) system is an integrated software system reflecting the business processes of an enterprise. ERP is often referred to as the packaged software. This is different from the traditional software in the sense the ERP software adapts the best practices in the industry as the base for the customer's requirements. An ERP system can be regarded as one of the most innovative developments in the information technology of the 1990s. The motivations for the enterprises to implement ERP systems are the integration, standardization capabilities, flexibility to customize the software and their abilities to drive the effective business process re-engineering and the management of core and support processes.

According to the AMR Research Report (www.amrresearch.com), the ERP market had a spectacular year, with total revenue growing by 14% and license revenue up an amazing 18% from 2005. While sales of traditional ERP applications were very healthy in 2006, many vendors also saw substantial revenue growth from the acquisition of other software companies. Large organizations continue to roll out SAP or Oracle, while many SMEs or smaller divisions of the large organizations are still in the ERP selection process, searching for the right point product or upgrading applications. As per the AMR Research report on ERP called "Enterprise Resource Planning Spending Report, 2006-2007," U.S. companies increased their ERP budgets by 11.3% in 2007. It also states that the enterprise resource planning (ERP) applications market grew to $25.4B in 2005, reached $29B in 2006 and over the next five years, the market will grow at an average of 10%.

The growth in ERP spending is fueled by several factors. As midsize organizations fight for market share against increasingly diverse global competition, increased profitability, revenue

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