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A Strategic Solution for Implementation of the Enterprise Resource Planning System

Yong Sik Jung*

요 약 오늘날 기업 전체를 경영자원의 효과적 이용이라는 관점에서 통합적으로 관리하고 최신의 정보기술을 활용하여 공급 사슬상에 있는 기업의 모든 경영자원을 효율적으로 계획하고 관리하는 경영시스템의 하나인 ERP가 많이 이용되고 있다. 본 연구에서는 이러한 ERP를 도입하여 실행하는 과정에 있어서 여러 가지 어려운 문제점에 대하여 논하고 그 해결 방안을 찾고자 한다.

Abstract An enterprise resource planning (ERP) system is an enterprisewide management system made possible by information technology. Organizations have been implementing ERP packages for integrating the business processes in various functions. ERP has been helping companies to automate their entire business processes within the organization as a whole instead of just in some functional units. This paper discusses the difficulties in the implementation process of ERP. Integration of core business processes throughout the supply chain; Tearing down of functional boundaries; Emergence of information technology as a process enabler.

1. Introduction

Many large organizations are integrating core business processes throughout the supply chain by implementing enterprise resource planning systems. Although some have encountered difficulties during the rigorous enterprise resource planning (ERP) implementation process, most problems seem to result from users trying to map a previously ill-behaved system to work within the structure of the ERP system.

A reader of the business press or an observer of organizations will notice three recurring themes being played out in highly competitive companies. These companies are focusing on core business processes that lead to customer satisfaction tearing down functional boundaries that inhibit cooperation, fragment processes, and discourage communications linking, integrating, and controlling processes with the use of powerful information technology, known as ERP systems.

Proponents of various business process engineering approaches assert that the ineffectiveness of most organizational processes stems from a "division of labor" mentality held over from the industrial era where processes remain fragmented through overspecialization and spread across departmental boundaries. As a result, operations require more effort to coordinate, and it is often difficult to determine who is responsible for the entire process. Management interventions such as reengineering seek to eliminate process fragmentation, organize work around key business processes, and exploit the enabling technologies of modern information technology (IT) to link the core processes of the enterprise.

The emergence of IT as a process enabler and integrator also deserves emphasis. Traditionally, the role of IT has been viewed as merely supporting the enterprise. However, in observing the most successful companies in today's competitive corporate environment, it is clear that the role of IT has become

* Department of Industrial & Systems Engineering, Kwandong University

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much more dominant from both strategic and operational perspectives. Most modern organizations would have difficulty maintaining an identity apart from the IT infrastructure that controls their processes and facilitates communications and transactions with their trading partners. ERP systems have received considerable attention in the IT press and various practitioner journals over the last several years. Larger organizations are implementing information systems that link the supply chain of the organization using a shared database and tightly integrated business processes. The dominant enterprise systems integrator is SAP AG (Waldorf, Germany) with approximately 30 percent of the ERP market. Oracle, PeopleSoft, Baan, and J. D. Edwards round out the major players in this market.

The potential benefits of ERP solutions include greatly improved integration across functional departments, emphasis on core business processes, proven and reliable software and support, and overall enhanced competitiveness. In implementing a configurable off-the-shelf ERP solution, an organization can quickly upgrade its business processes to industry standards, taking advantage of the many years of business systems reengineering and integration experience of the major ERP vendors.

2. Why organizations are turning to ERP

ERP system adoptions have accelerated over the past year. This can be attributed to several factors that are discussed in the following paragraphs:

Reengineering for Best Practice. Because of emerging competitive pressures in their respective industries, companies are scrambling to make changes in their core processes that will both meet customer demand and slash logistics costs associated with meeting such demand. For example, SAP touts its R/3 enterprise software as having over 1,000 catalogued "best" business practices compiled within its reference model. According to SAP advocates, these practices have been refined over 25 years of experience over thousands of implementations. Rather than "reinventing the wheel," adopting organizations generally compare their existing practices to the R/3 reference model and then make the necessary changes to the old processes to accommodate the R/3 process implementation. Baan (Baan Company, N. V., The Netherlands) delivers a somewhat smaller predefined process set, but provides tools (such as the Dynamic Enterprise Modeler) that enable customers to match their specific business processes and their organization model with the integrated Baan IV application suite.

Globalization and Multicurrency Issues. The global economy has fostered a business environment in which multinational operations are the rule rather than the exception. Obviously, many companies locate facilities abroad to exploit lower labor rates. Moreover, localization requirements often make it necessary for companies to maintain a manufacturing presence in countries they sell in. Clearly, globalization presents almost overwhelming challenges, ranging from cultural differences to multicurrency and value-added tax issues. ERP software has been designed with global organizations in mind and provides an integrated, centralized database that can accommodate distributed transaction processing across multiple currencies.

Existing Systems in Disarray. The authors assert that the wave of ERP implementations is at least partly due to a pent-up demand for an off-the-shelf solution to the general disarray across very large systems. The move to distributed processing appeased some end users as personal work stations and local area networks allowed users to participate in low-end processing. Generally, mission-critical applications remained on the legacy systems while the perceived gaps were filled through end-user computing. The resulting complexity and loss of centralized control are now almost universally recognized, and the push for server-side processing and "thin clients" is evidence of the backlash. Many organizations see enterprise systems as a return to centralized control over business processes.

Year 2000 Problems. Clearly, a significant factor driving many ERP implementations is the much-hyped Year 2000 problem. This computer-programming artifact, often blamed on legacy-era software, will cause many date-sensitive programs to crash at the turn of the century. Companies will have to spend millions of dollars to fix and test the millions of lines of existing computer code. Rather than spend this money on obsolete systems, the option of implementing

a state-of-the-art ERP solution such as R/3 is especially attractive.

Integration and Discipline. As Michael Hammer and James Champy emphasized in their bestseller Reengineering the Corporation[1] a major cause of broken systems is process fragmentation. That is, organizational processes tend to be spread across functional boundaries. As a result, many individuals and multiple departments must interact to complete a transaction. Coordination becomes complex with no individual or department assuming responsibility for the whole process. Often, no one knows the status of a transaction, or worse, the transaction "falls through the cracks." In addition, data entry and databases are often duplicated as individuals and departments attempt to impose control on their portion of the transaction where none exists for the process as a whole. With ERP, organizations see opportunities to enforce a higher level of discipline as they link their processes and share their database.

3. The benefits of enterprise systems

Conventional wisdom says that no single system software company can be all things to all companies. This basic attitude set the stage for a blitzkrieg assault of North American companies by the German company SAP AG. The viability of enterprisewide software capable of managing information needs for the entire company was ludicrous. Only a few short years ago the concept was virtually unknown by the majority of corporate America. Times have changed. The list of companies that have either adopted or are in the process of adopting enterprise software is impressive and growing at an accelerating pace. A brief look at several companies that have made the switch and some of their experiences follow.

Data reported by SAP AG concerning the new Fujitsu SAP system reveal the following. Fujitsu was facing increasingly complex business processes with a series of aging mainframes and software that could no longer be upgraded. After a successful 10-month installation of SAP they enjoyed the following benefits:

1) 90 percent reduction of cycle time for quotation from 20 days to 2 days.

2) 60 to 85 percent improved on-time delivery.

3) 50 percent reduction for financial closing times from 10 to 5 days[2].

"Manufacturers' Services Ltd. in Concord, MA is a $900 million company that has grown dramatically through acquisitions in Europe, Asia, and the United States. It is using The Baan Company software as the glue that keeps it all together. 'Traditionally, people have looked to ERP to run their basic operations,' says John Walshe, vice president of information systems. 'We want ERP to be an integrator for the company.'"[3]

General Motors selected SAP to enable common financial information and processes throughout the global corporation. The company expects the software to reduce greatly the cost and number of the many different financial systems currently employed throughout the world. Implementation of the new system is expected to be completed by the year 2002.

An interview with Boeing officials produced the following comment: "Baan forced us to look for ways to simplify our processes, and because the software is integrated, end users must now work together to solve problems within the internal supply chain."[4]

The incentive for adopting enterprise software varies greatly from company to company. One common thread, however, is the anticipated business improvement that will follow adoption. Roy Clothier, president of Pacific Coast Feather Company, explained the experience of his company as follows: "R/3 has all the tools we need to run our business," Clothier says. "We're already getting very satisfactory results -- like reducing our inventory at the same time that we are improving our ability to service our customers -- and we feel we're only scratching the surface of the benefits that are out there. Every day we find new ways to gain more value from R/3."[5]

The IBM Storage Products Company experienced the following success with its ERP system: 110 days after the system went into production, SPC recognized the following improvements: the time for checking customer credit upon receiving an order reduced from 15 to 20 minutes to instantaneously; responses to customer billing inquiries occurred in real time, versus 15 to 20 minutes; entering pricing data into the system took five minutes where it could take 80 days before; and shipping repair and replacement parts was done in

three days, compared to as many as 44.[6]

Most companies adopting ERP software appear to be well satisfied. Not all companies, however, have enjoyed this same degree of satisfaction. One noted exception is FoxMeyer Health Corp. FoxMeyer expected the technology to cut cost, speed up inventory turnover, and increase the availability of useful information. Company spokesman Wade Hyde, however, sums up what FoxMeyer found, in the following comment: "The computer-integration problems we had were a significant factor leading to the bankruptcy filing."[7]

4. The implementation process

The IT press has focused significant attention on the trauma that often accompanies the implementation of ERP systems. Clearly, the introduction of an enterprise system is a nontrivial event in any organization. Given the scope of organizational change triggered by the typical implementation, it should not come as a surprise. Successful enterprise systems require a high degree of discipline from the organization. Consequently, organizations not accustomed to this level of discipline will struggle with such a comprehensive intervention. For example, an R/3 implementation forces the organization to examine all of its existing processes and compare them with the "best practices" incorporated within the package. In reconciling the differences (or "gaps"), the organization must generally reengineer its processes to fit R/3. Although it is theoretically possible to modify R/3 (make changes to the source code) to fit the existing organizational process, few experts would advise this approach. Current implementation wisdom emphasizes the need to leave the software in its "vanilla" state. The price to be paid for adding "chocolate chips" is higher implementation cost and increased difficulty of incorporating future software upgrades.

As is typical with any large-scale systems implementation, organizations adopting ERP use highly structured, phased methodologies. These projects are complex undertakings that must address issues such as process and task redesign, hardware, software, database administration, and software configuration. While such methodologies are beyond the scope of this article, a few of the major milestones are described as follows:

Form the Implementation Team. While almost all organizations find it necessary to bring in outside ERP consulting expertise, the process requires a dedicated team of managers and other key employees that may convene for a period of months, perhaps years, to establish the plans, develop the objectives of the project, and manage the implementation process.

Blueprint the Current State. The process typically begins with an assessment of the "current state" of organizational processes. The implementation teams will usually use process modeling techniques and software to document business events, the tasks that must be performed, the individuals and departments who perform them, the flow of information, and the linkages to other processes within the organization. From the current state, the team should identify existing weaknesses and opportunities to reengineer for best practice.

Gap Analysis. With the enhanced understanding and documentation of the current state, the implementation team can then compare the current state with the business processes and solutions the system provides. As a practical matter, the organization will almost always adopt the ERP process version. Therefore, the gap analysis reveals the major process discrepancies that will require significant changes to existing processes. Occasionally, the ERP product may not offer a corresponding process. In such cases, the organization may require a work-around solution.

Design, Scripting, and Configuration. The design of the new processes will generally evolve in an iterative fashion as the implementation team, assisted by key users, designs and documents the reengineered processes. The team prepares scripts of each of the redesigned processes to assist the user in navigating the system. The scripts will identify the steps within each process, the menu path the user must take, the system screens that will be accessed, explanations of the data fields that require input, and key decision points the user must address. The process designs will also drive the configuration of database tables that allow configuration of business objects such as data entry screens and reports.

Simulation, Testing, and Training. As with any

systems implementation, extensive simulation and testing is required with the newly configured system prior to going "live." Testing takes place on a test "instance," a logically distinct version of the database. Experienced ERP integrators recommend that simulations be conducted by nondevelopment team members. Similarly, users new to the environment are trained using a "sandbox" instance prior to introducing them to the live production system.

Going Live. The intense implementation process culminates in the live activation of the actual production system. At this stage, master and transaction database files have been populated with genuine records. Basis administration has been established and technical support mechanisms are in place. Graphical user interfaces have been installed on the applicable work stations and users trained in their use. Assessment mechanisms must be implemented to assure the ongoing business integrity and to monitor basis systems performance.

5. The challenges of ERP implementation

Obviously, many implementation problems relate to situations or processes that are unique to a particular company. The most frequent problem cited in the FoxMeyer experience described earlier was the inability of its enterprise software to handle the sheer volume of transactions required. In the Monsanto case, training its staff of some 18,000 employees to use the software after installation has turned out to be a significant problem. The lack of employees trained in the installation and use of ERP software is currently a global problem. With so much interest and movement toward such solutions in the past couple of years, there is a shortage of knowledgeable, experienced people to assist with the adoptions. Many, if not most, World Wide Web sites of ERP partners have a section dealing with systems-related employment opportunities.

6. Conclusion

Even though there appears to be a near stampede to adopt ERP systems worldwide, many significant questions linger. Not only are there the basic questions unique to potential adopters such as: Does the new system really fit the organizational needs? Does the organization have strategic business reasons for adopting the software? Do the cost of software implementation and the resulting disruptions of the business process outweigh the potential benefits that may be gained? Other broader questions can also be raised.

ERP solutions have been touted as "best practice" software. This claim is based on the long development period of a dynamic program. Given so many recent changes in the way the world does business, is it possible that this software incorporates all of these recent improvements? Does a company currently employing state-of-the-art business practices lose its competitive advantage by adopting standard practices used by all companies currently using ERP software?

These questions, along with many other questions, may be difficult to answer. Perhaps only time will provide clues into the wisdom of the global movement toward enterprise software. This much currently is known; many of the largest companies in the world are adopting the software and singing its praises. Improvements will undoubtedly be made as ERP vendors respond to the needs of the corporate world. The companies watching the show from the sidelines may be well advised to become part of the cast.

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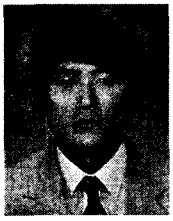

정 용 식

1983, 2. 대구대학교 산업공학과 졸업(공학사)
1985, 2. 건국대학교 대학원 산업공학과 졸업(공학석사)
1985,3-1988,2 대구대학교 산업공학과 강사
1988,3-1989,3 일본 오사카부립대학 생산기술연구소 연수
1992, 6. 일본 오사카부립대학 대학원 경영공학과 졸업 (공학박사)
1993, 3-현재 관동대학교 산업시스템 공학과 부교수

일본경영공학 및 OR학회 정회원, 대한산업공학회 및 한국경영과학회 정회원, 한국산업정보학회 이사