A Empirical Study on Situational Factor of ERP Introduction

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Key Words : ERP, ERP value,ERP system, Situational Factor , ERP introduction

Abstract

In today's dynamic and turbulent business environment, in order to become globally competitive, many companies are trying to get closer to the customer and deliver value added product and services in the shortest possible time which demands integration of business processes of an enterprise. Enterprise Resource Planning (ERP) is such a strategic tool, which helps the company to gain competitive edge by integrating all business processes and optimizing the resources available. This paper throws light on how ERP evolved, what makes up an ERP system and what it has to offer to the industries. The paper includes the role of ERP, perception of ERP value, ERP plan and direction. The author also argues checkpoints as a preview to ERP introduction.

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Ⅰ. INTRODUCTION

In today's fiercely competitive business environment, there has to be much greater interaction between the customers, manufacturers and suppliers. This means that, in order to produce goods tailored to customer requirements and provide faster deliveries, the enterprise must be closely linked to both suppliers and customers. In order to achieve this improved delivery performance, decreased lead times within the enterprise and improved efficiency and effectiveness, manufacturers need to have efficient planning and control systems that enable very good synchronization and planning in all the processes of the organization. Today, however, the challenge is intense and requires a strong integration across the value chain. Enterprise Resource Planning is such a strategic tool, which equips the enterprise with the necessary capabilities to integrate and synchronize the isolated functions into streamlined business processes in order to gain a competitive edge in the turbulent business environment.

Ⅱ. IMPORTANT ISSUES IN ERP

ERP attempts to integrate the suppliers and customers with the manufacturing environment of the organization. The essence of ERP is the fundamental premise that the whole being greater than the sum of its parts. The traditional application systems, which the organizations generally employ, treat each transaction separately. They are built around the strong boundaries of specific functions that a specific application is meant to cater. For an ERP, it stops treating these transactions separately as stand-alone activities and considers them to be the part of the inter-linked processes that make up the business.

The only problem of almost all the typical traditional application systems like MRP is that there is no link between the application systems being used by different departments. An ERP system also does the same thing, but in a different manner. There are hundreds of such data tables, which store data generated as a result of diverse transaction, but they are not confined to any departmental or functional boundaries, rather integrated to be used by multiple users, for multiple purposes and at multiple places.

It is not possible to think of an ERP system without sophisticated information technology infrastructure. It is said that, ERP is the finest expression of the inseparability of business and information technology. The incremental improvement in the IT and the drastic reduction in prices of computer have made it possible even for the small organizations to think about ERP systems. It is assumed that the companies implementing ERP solutions have multiple locations of operation and control. Hence, the online data transfer has to be done across locations. To facilitate these transactions, the other

important enabling technologies for ERP systems are Workflow, Workgroup, GroupWare, Electronic Data Interchange (EDI), Internet, Intranet, Data warehousing, etc.

Today, ERP also is being implemented in almost all types of organizations irrespective of their mode and spread of operation such as manufacturing, distribution, finance, service and maintenance, transportation etc. An ERP system should be sufficiently versatile to support different manufacturing environments like make-to-stock, assemble -to-order and engineer-to-order. The customer order decoupling point (CODP) should be flexible enough to allow the co-existence of these manufacturing environments within the same system. It is also very likely that the same product may migrate from one manufacturing environment to another during its produce life cycle.

The system should be complete enough to support both Discrete as well as Process manufacturing scenarios. The efficiency of an enterprise depends on the quick flow of information across the complete supply chain i.e. from the customer to manufacturers to supplier. This places demands on the ERP system to have rich functionality across all areas like sales, accounts receivable, engineering, planning, Inventory Management, Production, Purchase, accounts payable, quality management, production, distribution planning and external transportation.

More and more companies are becoming global and focusing on downsizing and decentralizing their business. For these companies to manage their business efficiently, ERP systems need to have extensive multi-site management capabilities. The complete financial accounting and management accounting requirements of the organization should be addressed. It is necessary to have centralized or de-centralized accounting functions with complete flexibility to consolidate corporate information.

ERP package has emerged to offer an integrated IT solution. It is suggested that ERP could facilitate achieving compatibility between task characteristics and technology characteristics[Chung and Snyder, 2000]. ERP system is the dominant strategic platform for supporting enterprise wide business processes. However, it has been criticized for being inflexible and not meeting specific organization and industry requirements. [Light et al., 2001]. Therefore, it is importance to find out ERP system that is suitable for companies.

Bernroider and Koch (2001) found out that a total of 29 different ERP selection criteria have been identified through application of the Delphi method togetherwith students, practitioners and researchers from the Institute of Information Processing at the Vienna University of Economics and Business Administration. Furthermore, they explored that differences in the weights attributed to 12 criteria between small to medium sized and large organizations.

Everdingen et al. (2000) suggested that European midsize companies tend to focus on product characteristics rather than on characteristics of the ERP

supplier of the product. And the way in which most organizations select and manage applications is on the basis of business features and functionality [Sprott, 2000].

As has been argued in Montazemin et al. (1996) and Willcocks and Sykes (2000), the participation of the people, project initiator, decision maker might have influence on software package assessment and adoption. Willcocks and Sykes (2000) suggested that chief information officer (CIO) and the information systems (IS) department had to transform themselves in dealing with the challenges of adopting enterprise-wide systems like ERP to the specific needs of their organization. Furthermore, effective IT-based innovations require a high level support and a project champion.

There are various ERP vendors available today such as SAP AG, Oracle, BaaN, Infosystems, People Soft etc. which offer slightly different features in their products. Some important points to be kept in mind while evaluating an ERP software include: 1) functional fit with the company's business processes 2) degree of integration between the various components of the ERP system 3) flexibility and scalability 4) complexity; user friendliness 5) quick implementation; shortened ROI period 6) ability to support multi-site planning and control 7) technology; client/server capabilities, database independence 8) availability of regular upgrades 9) amount of customization required 10) local support infrastructure 11) availability of reference sites 12) total costs, 13) Security(Data and System) including cost of license, training, implementation, maintenance, customization and hardware requirements.

The success of an ERP solution depends on how quick the benefits can be reaped from it. This necessitates rapid implementations, which lead to shortened ROI periods. Traditional approach to implementation has been to carry out a Business Process Re-engineering exercise and define a ``TO BE'' model before the ERP system implementation. This led to mismatches between the proposed model and the ERP functionality, the consequence of which was customizations, extended implementation time frames, higher costs and loss of user confidence.

Ⅲ. RESEARCH SETTING AND INSTRUMENTS

To identify the purposes and the checkpoints in firms purchasing ERP S/W, The population for the survey consisted of participations who were in charge of IT related department and might be able to influencing on ERP project decision in companies in Korea. Target survey company were identified from the Directory of Korean Business Firms in 2001. A survey was conducted in the summer of 2002. questionnaires accompanied by a presentation letter were mailed to 978 firms of sampling population. 232 firms from sampling population responded for this study.

The firms were asked to answer the ERP

checkpoint in categories, including ERP value, plan, direction, and the size of investment. The purposes and the checkpoints were measured on a 5-point scale. The survey excluded financial firms and companies under supervision. The sample presents a variety of industry groups and size of firms as shown in Table 1 and Table 2.

<Table 1> Respondent Classification Type of Business (%)

Food & Beverage	Chemical	Machinery	Electronics	Logistics	Construction
5.2	20.7	34.5	8.6	20.7	10.3

<Table 2> Number of Full time Employees (%)

Less than 49(Small Firms)	50 to 299(Medium Firms)	300 or more(Large Firms)
20.7	24.1	55.2

89.4% of the surveyed firms are currently using LAN and WAN to communicate. Most of the companies (85.4%) are interested in the computerization of management and using telecommunication network.

To find out firms' needs of support, data obtained was analyzed by a computer statistical package. Especially to analyze the roles of supporting organizations, this paper used frequency and chi-square analysis. Statistics are presented for exploratory and descriptive purpose rather than hypothesis testing.

1. ERP Introduction and Checkpoint

1) ERP Introduction

Many business firms are interested in ERP introduction as a tool for strengthening industrial competitiveness and improving process efficiency. As a result, most of them are actively driving ERP project now.

(1) Perception of ERP Value

<Table 3> Degree of ERP recognition(5 point scale)

	ERP recognition	ERP performance recognition
Mean(s.d.)	4.04(0.84)	3.93(0.86)

Table 3 shows the degree of recognition on ERP and its performance. According to a survey of 232 companies, the values are higher than mid point of 2.5, which means lots of firms recognized on ERP very well.

(2) Source of Information on ERP

In most of the firms, information on ERP was gathered from ERP-related

organization (38.2%) and ERP consulting company(32.7%), with 18.2% and 10.9% getting ERP information from newspaper and broadcasting and professional books respectively. What this means is that many firms are having in-dept knowledge on ERP.

<Table 4> Source of Information on ERP

Newspaper and Broadcasting	Professional Books	ERP related Organization	ERP Consulting Company
18.2%	10.9%	38.2%	32.7%

(3) ERP Introduction Plan

51.4% of the respondents are planning to use outsourcing to build ERP, with another 32.4% saying that they have plans to purchase only ERP package when they propel ERP project. Only 16.2% said that they are going to develop ERP solution themselves. It shows that they don' t want to take risk in the process of building ERP, in which much funds and manpower are needed and long lead time to operation are taken.

<Table 5> ERP Introduction Plan

In house Development	Outsourcing	Purchasing only ERP Package
16.2%	51.4%	32.4%

① Investment in ERP

Table 6 shows the size of investment funds in ERP. Surprisingly, 22.9% of firms are willing to invest more than US$500,000 in ERP.

<Table 6 > The Size of Investment in ERP

Less than US$50,000	US$50,000 100,000	US$50,000 100,000	More than US$500,000
25.7%	25.7%	25.7%	22.9%

② Direction of ERP Introduction

Not to fail to operate ERP, it is necessary to set the right direction of ERP introduction. Table 7 shows that many firms emphasize on economic point of view(36.51%), practical usability(33.33%), and speedy implementation(22.22%) when they introduce ERP. Only 7.94% of the respondents pointed out total optimization.

<Table 7> Direction of ERP Introduction

Economic point of view	Practical Usability	Speedy Implementation	Total Optimization
36.51%	33.33%	22.22%	7.94%

2) Checkpoints

Many companies check several points when they introduce ERP. Table 8 lists checkpoints in sequence based on the mean values that provide indications of the relative importance. We see that the most important checkpoints were performance, main reference sites, and availability of current resource. Of all the checkpoints, the two that received the least attention were vendor size and market share.

<Table 8> Checkpoints

Checkpoints	Mean Values	Standard deviations
Performance of Introduction	4.50	0.80
Main References Sites	4.31	0.78
Availability of Current Resource	4.22	0.67
Easiness of Introduction	4.06	0.62
Operation System	3.97	0.90
Past Records of Supply	3.81	0.81
Market Share	3.72	0.87
Vendor Size	3.69	0.88

IV CONCLUSIONS AND IMPLICATIONS

In the past decade the business environment has changed dramatically. The world has become a small and very dynamic marketplace. Organizations today confront new markets, new competition and increasing customer expectations. This has put a tremendous demand on manufacturers to; 1) Lower total costs in the complete supply chain 2) Shorten throughput times 3) Reduce stock to a minimum 4) Enlarge product assortment 5) Improve Product quality 6) Provide more reliable delivery dates and higher service to the customer 7) Efficiently coordinate global demand, supply and production. Thus today's organization have to constantly re-engineer their business practices and procedures to be more and more responsive to customers and competition. In the 1990's Information technology and Business Process re-engineering, used in conjunction with each other, have emerged as important tools, which give organizations the leading edge.

The results shown in this paper has strong implications for ERP vendors. We

see that the most important checkpoints are performance, main reference sites, and availability of current resource. Of all the checkpoints, the two that received the least attention were vendor size and market share.

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