

# **JAPANESE COMPANIES AND ERP: A STUDY ON INFORMATION TECHNOLOGY AND MANAGERIAL STYLE**

Hideki Yoshihara

Research Institute for Economics and Business Administration, Kobe University,  
yosihara@rieb.kobe-u.ac.jp

Yoko Okabe

Faculty of Business Administration, Kyoto Sangyo University,  
okabeyo@cc.kyoto-su.ac.jp

## **ABSTRACT**

In the so-called e-revolution many companies in the world have successfully adopted to new IT (information technology) and implemented business reforms. This scenario, however, does not seem to apply to most Japanese companies because their unique managerial style is quite incompatible with the evolutions in IT. To look at the situation more thoroughly, we focus on ERP (Enterprise Resource Planning) which is now being increasingly installed in companies worldwide. ERP is a software and its basic philosophy is that it models “the best practices” of western companies and that it helps companies utilize business data efficiently to enhance their business performance. This merit of using ERP conflicts with the managerial style of Japanese companies which emphasize business practices specific to individual company, particularly in manufacturing. In this sense Japanese companies are now in a difficult and tense situation in dealing with the global trend of using ERP in business practices.

**KEYWORDS:** ERP, managerial style of Japanese companies, best business practice

## **1. INTRODUCTION**

Our research is aimed at exploring what impact ERP, also known as ES (Enterprise System), has on to the management of Japanese companies. Are the features and the philosophy of ERP compatible with those of managing Japanese companies? What are the strengths and weaknesses of introducing ERP? These are the primary questions we intend to examine in this paper.

From technological standpoint, ERP has two features. First, it is a package software for general

use, meaning that it is not developed for the purpose of meeting the specific needs of a certain company. Second, most kinds of ERP softwares are developed based on the western companies' business practices such as human resource management, accounting, sales and production.

There are basically three effects drawn from ERP. The first is the effective use of business data collected through business activities such as sales figures, customer information, products sold, price and the date and time of the transaction. For such data to be effectively used, ERP must be installed in all or many departments and business domains to quickly obtain all (or many) necessary business data of both domestic and overseas offices and analyze them immediately. The second effect is to realize business reform. ERP is based on the business practices of top US and European companies so that companies installing ERP can easily imitate "the best practices" in all departments and business domains including accounting, human resources, manufacturing, sales and purchasing. If the level of the business practice of a certain Japanese company is behind that of Western countries, the company can improve their businesses with the help of ERP. However, ERP does not provide any advantage if the company already has achieved a superior business practice over others. The third effect is to overcome the limit of the existing computer information system called "legacy system."

The installation of ERP can be done in two ways. One is to install in almost all business activities and the other is to install in specific business domains. ERP is designed to be used in all business domains and its true value such as enabling the effective use of business data is fully appreciated when it is introduced that way. Despite this fact, many Japanese companies are installing ERP only in certain departments such as accounting, human resource management and sales.

As for the method of our research, our research relies primarily on interviews and we have conducted nearly thirty interviews to companies, universities and individuals, some of which are listed at the end of this paper.

## **2. THEORETICAL FRAMEWORK: INCOMPATIBILITY OF ERP AND JAPANESE COMPANIES**

### **2.1 What ERP means to Japanese companies**

We would like to look more into details at the following characteristics of ERP's functions so as to observe ERP's impact on the management of Japanese companies.

(1) ERP brings standardization of business practices. ERP is a package software used by various companies. This means that the business practices of user companies become quite similar to one

another and that they cannot spread their own unique business practices through ERP.

(2) As Thomas Davenport points out, ERP assumes that business practices are not the source of competitiveness for companies. In making his point, Davenport refers to a couple of US companies.

When Compaq managers decided to build their own functionality in competitively important business domains... Similarly, when Intel decided for reasons of competitive advantage that its ES implementation would not include manufacturing systems, managers knew that interfacing proprietary with the company's ES package would be difficult. But manufacturing excellence is one of Intel's core strategic capabilities, and a system that could also be adopted by a competitor was inconsistent with their competitive goals.<sup>1</sup>

(3) Using package software means that users have to outsource their computer systems. Hence, ERP brings standardization in business practices that used to rely on a computer system unique to that company.

(4) Since ERP is developed by a third party called vendor specializing in computer information system, to use ERP means to utilize external managerial resources provided by system integrators (SI), consulting firms and software vendors.

(5) Corporation using ERP in their business transactions contribute to network externality which means that as the number of companies joining the network increases both the value of the network and the merit of each participant increases. For example, electronic commerce can be done more easily if the companies engaged in business transactions are using ERP. Another example is witnessed in obtaining specialists who do the maintenance and management of computer information system. Network externality is generated by the fact that ERP is being installed by multiple numbers of companies in the US and Europe and has now become a global standard.

## 2.2 What is the so-called "Nihonteki-keiei" or the unique managerial style of Japanese companies?

Although the traditional and peculiar managerial style of Japanese companies has been given many different definitions, we would like to define it as a business philosophy behind business practices of the management of Japanese companies. The following aspects of that philosophy are particularly relevant in observing the impact of ERP on Japanese companies.

(1) In Japanese companies managerial resources are internally accumulated over a long period of time. Such an internal accumulation means that managerial resources attributed to workers such as technical skills and business knowledge are neither standardized nor described in job descriptions and

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<sup>1</sup> Davenport, 2000, p.109.

business manuals. This lack of standardization and description enables Japanese companies to respond flexibly to customers' needs and the changes in the business environment. In recent years, however, because Japanese workers are beginning to change jobs more frequently it will become inevitable for Japanese companies to introduce job manuals as well as information systems based on them. It is becoming difficult for Japanese companies to retain the traditional style of management.

(2) Accumulation of small improvements at the work place is particularly seen at production sites in Japan. Japanese factory workers are expected to provide ideas to improve their own work by giving suggestions or participating in QC (Quality Control) circles. These ideas about small improvements are suggested everyday and most of them are actually implemented.

(3) Many Japanese companies place importance on business practices such as manufacturing to improve their competitiveness. By improving manufacturing activities they can achieve reductions in both production costs and rejection rates. They can also enhance the quality of their products. Generally speaking, the sources of competitiveness derive not only from business practices but also from the development of new products, business strategy, business system, brands, strategic alliance and M&A, factors to which American and European companies usually pay attention while trying to keep their business practices at the same level as their competitors.

### 2.3 Tension between ERP and the managerial style of Japanese companies

As we have argued, the philosophy of ERP and the managerial style of Japanese companies are quite different and are, in fact, almost the antithesis of each other. However, many Japanese companies are now in a situation where they have to introduce ERP due to the aforementioned advantages it provides.

Before ERP was introduced in the market, Japanese companies had been using computer information systems they had developed on their own. These systems usually needed only minor changes and rarely underwent comprehensive revisions. Hence, such a system tends to rely on softwares based on the accumulation of past patchworks and grow itself into a large and aged system called "legacy system" or "spaghetti." It is difficult and costly to maintain, revise, improve and change these softwares.

Another problem of developing an in-house system concerns human resources. Computer system specialists are expected to build, revise and maintain the most updated and sophisticated system but the specialists with high skills are in shortage. Engineers cannot develop their skills as long as they stay with the same company because much of their time is spent responding to specific needs of their

company.

Both from the standpoint of technology and personnel, internally developed information systems using general purpose computers are reaching their limits. Many Japanese companies are now in a situation where they have to install ERP which is in its nature quite unsuitable to the managerial style of Japanese companies. This is the reason we say there is a kind of “tension between ERP and the managerial style of Japanese companies.”

### **3. HOW ERP IS ACTUALLY USED IN JAPANESE COMPANIES**

#### 3.1 Modular installation

According to a questionnaire about the introduction rate of ERP, 14.8% of the surveyed companies in 2001 were using ERP compared to 11.3% in 2000. In this survey conducted in 2000 and 2001, large companies accounted for 52.0%, medium size companies 45.4% and small companies 2.6%.<sup>2</sup> Based on this survey the larger the corporate size the more likely it uses ERP.<sup>3</sup>

How ERP installed differs according to each department and business domain. 46.5% of the surveyed Japanese companies use ERP in accounting and 41.4% in financing. After these two departments, 39.7% of Japanese companies use ERP in human resource departments. Compared with these departments specializing in office work, those specializing in line work such as production, sales and purchasing have smaller ratio; 12.3% of the surveyed Japanese companies use ERP in sales and warehouse, while the figures for purchasing and production are 12.3% and 10.2% respectively.<sup>4</sup>

As we have already pointed out, ERP is designed to be installed as a comprehensive system and not in a piecemeal way. According to a survey, only 110 companies or 36% of the surveyed Japanese companies using ERP installed more than four modules.<sup>5</sup> These companies include those installing softwares from more than two vendors. This means that the number of companies installing ERP in all of their business domains seems to be less than one third among the surveyed companies. Based on this survey, there exists a large gap between the rate of ERP usage among staff workers and the rate of

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<sup>2</sup> ERP Research and Promotion Forum/Information Center, *Survey in the Status of Installed Enterprise Application System in Japan*, July, 2001, p.7.

<sup>3</sup> ERP Research and Promotion Forum/Information Center, *Survey on the Status of ERP in the US*, November 2001, P.4. Out of 1000 largest companies listed on *Fortune*, 291 companies use ERP. According to this survey, the rate of installation of ERP in Japanese companies is only 15% as opposed to 30% of the US companies.

<sup>4</sup> ibds, p.8.

<sup>5</sup> This survey was conducted by Nikkei Telecom against the companies introduced in the articles in four kinds of Nikkei Newspapers and Nikkei Computer during the period between January 1994 and March 2003 and in Nikkei Jyoho Strategy after January 1996.

ERP usage among line workers. Since ERP was originally developed for accounting, most of users install it in accounting departments, a trend which is seen in Europe as well. However, only a few Japanese companies use ERP in line works such as manufacturing, sales and purchasing.

Toyota, famous for the Toyota production system, has no plan to introduce ERP in manufacturing. They are using their internally-developed computer system mainly because their manufacturing system has a competitive edge over others. They try to increase their competitiveness by reducing the rate of rejected products, increasing productivity and cutting cost through their daily effort to improve factory operations. Toyota's ability to improve its production system is the source of their competitiveness and they are unwilling to change this system by using ERP in a comprehensive way.

Denso, a manufacturer of components for Toyota, also considers production system as the source of its competitiveness. It implements its own production system not only in Japan but also in overseas factories.<sup>6</sup> On the other hand, Denso plans to introduce ERP for the purpose of conducting consolidated accounting more effectively with Toyota which uses ERP for accounting purpose. Bosh, the biggest competitor of Denso, is said to have installed SAP's R/3 in manufacturing; on the other hand Bosh uses their originally developed information system in the development of new products, an area where it enjoys a competitive edge over others.

In contrast to aforementioned Japanese companies, Takeda Chemical Industries has installed SAP's R/3 in manufacturing. For pharmaceutical companies, development of new drugs is the most important activity and almost the only source of competitiveness. Other departments and business domains such as purchasing, supplying, manufacturing, quality control, shipment and distribution of products are far less important.<sup>7</sup> According to Takeda's internal document in its information system department, "Since we do not compete in logistics it should be simplified and standardized. Our competitiveness lies in research and development...As for the domains where we do not need to compete, investment should be kept as small as possible."<sup>8</sup>

Another reason why many Japanese companies do not install ERP in line works is that they try to accumulate small incremental advantage at the sites such as sales, purchasing and distribution. If the change in a business practice after implementing improvements accompanies changes in business data, computer information system itself must be changed or modified. The companies' system engineers can easily change the system they have developed on their own. But if they are using ERP, they cannot make many changes to it except for setting its parameters. The companies have to rely on

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<sup>6</sup> Fujiwara & Yoshihara, 2003, pp.213-230.

<sup>7</sup> Suzuki & Yasuda, 2001.

<sup>8</sup> Internal document from Takeda on R/3 installation in logistic system.

outside specialists to use ERP, which deters small improvements on the work sites.<sup>9</sup>

There are other reasons why it is difficult to change ERP to respond to the changes and improvements in business practices. When adds-on or modifications are done on ERP software, all other kinds of software related to business have to be changed. The more changes, the more difficult it becomes to get maintenance services from ERP vendors.

### 3.2 Many changes to the system

Japanese companies tend to add many functions to ERP, which is a unique Japanese phenomenon. SAP Japan (Japanese subsidiary of SAP) told the authors that the most common way Japanese companies install ERP is piecemeal and not comprehensive, which means installation by module units or add-ons. A company called Advantest, a manufacturer of machines for semiconductors, has installed ERP supplied by Globia International (a subsidiary of Fujitsu). In introducing the system, president Oura said, “We will accommodate our business practices to ERP. We will not allow the sites to keep doing their own ways.”<sup>10</sup> However, in the aftermath, as many as 287 requests for modification came from employees and 51 of them had to be accepted.

Why are there so many user modifications in Japanese companies? One reason is that their business practices are different from those of the United States and Europe on which ERP is based. For instance, many business practices for transactions among Japanese companies cannot be dealt with by ERP because of peculiar technical terms and business practices such as the following: ways of accounting sales or purchasing cost, retirement pension system for employees, company housing system or year-end adjustment of salary for tax purposes. The second reason is that many Japanese business practices are specific to each company. Each company has its own way of carrying out business practices and these do not fit for standardization. Additionally, a large number of Japanese companies seem to consider their business practices such as in manufacturing to be either superior or equal to those of the US and European companies.

### 3.3 Low Evaluation

As a matter of fact, not many Japanese companies are fully satisfied with the results of introducing ERP. Indeed, many Japanese companies criticize or complain about ERP. According to a

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<sup>9</sup> Fujimoto, 2001, p.192.

<sup>10</sup> *Nikkei Joho Strategy*, Feb., 1999, pp.14-17.

survey among ERP users, 11.9% of the respondents were “dissatisfied” and 16.2% were “rather dissatisfied.” Thus, based on this survey more than one fourth of the companies are not quite satisfied with ERP. A consultant who was involved in the installation of ERP told the authors, “if the system works, then we consider it successful.” This view about ERP seems to be shared by specialists of information systems in Japan. If the ERP is actuated and the company’s operations flow smoothly, they consider the installation of ERP as a success. They do not seriously question whether the efficiency of business activities is enhanced or whether the business data has come to be utilized efficiently. The ratio of the profit against ERP-related investments is not scrutinized either.

We would like to point out that Japanese companies characteristically expects to get the same level of output from ERP as they get from existing information system such as a chart showing the total of sales or accounting figures. Although ERP is designed to achieve the efficient utilization of business data, Japanese companies do not pay much attention to this objective. The fact that most Japanese companies install ERP in specific departments and business domains negates ERP’s true potential in efficiently using business data. Another reason is that top and lower managers do not have the intention of using business data efficiently. Many of them do not request what kinds of data they need to resolve certain problems or to make decisions quicker.

#### **4. HOW THE JAPANESE COMPANIES ARE DEALING WITH ERP**

We have already discussed that the managerial style of Japanese companies is unsuitable for ERP in their basic philosophies. Then how should the managerial style be changed in order for the companies to appreciate the merits of using ERP? How will the installation of ERP change their managerial style? Before thinking about these important questions, we would like to discuss the factors to be considered in finding the most idealistic ERP for the Japanese companies.<sup>11</sup>

The first factor concerns the relation between the management of business data and business process. The primary objective for Japanese companies in installing ERP is not to replace company’s internally developed computer system but to cover its shortfalls. The other two objectives are to use

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<sup>11</sup> The following factors will be critical in thinking how to change the managerial style in order to adopt to ERP. The first is to utilize business data more thoroughly by changing the traditional managerial style based on experience, inspiration and tenacity to the one based on collecting and analyzing data and making decisions based upon those data before taking an action. In relation to this, the speed of management could be enhanced by taking advantage of ERP which provides business data on real time basis. The second is to change business practices so as to be able to produce accurate business data reflecting the actual management by, for instance, changing the traditional business practices of shifting the figures in accounting statements to that of business subsidiaries. The third is to shift the source of competitiveness from business practices to business strategy, research and development, brands, business system and strategic alliance.

business data effectively and to improve business activities. However, not many Japanese companies are concerned about the last two objectives and most of them only try to get the same data from ERP that they get from their own existing system. Their primary concern is to get necessary data while retaining the existing business processes. For this purpose the relationship between the management of business data and business processes better be cut off or at least be kept as weak as possible. The kind of ERP that fits the needs of Japanese companies is what can be used without requiring any changes to the companies' business processes.

The second factor concerns the comparison of comprehensive installation and piecemeal installation. Installing a module-based ERP is a more realistic option than installing a integral-type ERP for Japanese companies. From the standpoint of users, the most convenient way of installing ERP is to install each module one by one starting from the departments where installing ERP is easy or the needs for its installation is great. Module-based ERP can be installed separately in each business domain (e.g., accounting, human resources, manufacturing and sales) and that a change made in a certain business activity in a department does not interfere with an ERP software installed in other departments.

The third factor concerns the difference in managerial models that ERP software uses. For Japanese companies, softwares that models Japanese business practices are preferred to ERP softwares that models the US and European countries. As we have already stated, Japanese companies hope to maintain their current business practices.

Considering the above factors, the kind of ERP which is most suitable for the managerial style of Japanese companies must have the following three characteristics: (1) the weak relationship between the management of data and business processes; (2) module-based ERP rather than integral-type ERP; and (3) ERP softwares that models the business practices of Japanese companies.

The kind of ERP most widely used not only in Japan but worldwide is SAP's R/3. According to a survey, the number of company installing SAP is 154 (49% of the total 313 companies surveyed), Oracle is 49 (16%), People is 25 (8%), BAAN is 21 (7%) and J.D. Edwards is 16 (5%), BPCS is 14(4%) and others is 88(28%).<sup>12</sup> Unfortunately SAP's R/3 does not have much of the aforementioned characteristics that are required to meet Japanese needs. Although a considerable number of Japanese companies seem to install SAP R/3, they do so with neither solid corporate investment strategy in IT nor thorough evaluation of the suitability of using ERP with their respective management styles. The

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<sup>12</sup> This survey was conducted by Nikkei Telecom(<http://telecom21.nikkei.co.jp/nt21/service/>) against the companies introduced in the articles in four kinds of Nikkei Newspapers and Nikkei Computer during the period between January, 1994 and March, 2003 and in Nikkei Joho Stratedy after January, 1996. The total number of companies installing ERP is 367 out of which 313 companies were surveyed.

tension between ERP and the managerial style of Japanese companies is clearly observed in Japanese companies using ERP developed in Western companies. The usage of SAP's R/3 by Japanese companies exhibits such a tension most strikingly.

## **5. CONCLUSION**

Two of the authors in this team, Yoshihara and Okabe, have done a joint research focusing on the language problem in the management of Japanese multinational companies and insisted that Japanese companies should use English as the basic language.<sup>13</sup> It is not easy for the Japanese business persons, most of whom have inadequate English competency in using English in management so that the level of their managerial practices could decline due to the reduction in the amount and the quality of effective communication. From a global perspective in the long term, however, the Japanese companies have no other choice but to conduct their international management in English. The current situation of Japanese companies concerning English is almost tragic. In order to compensate for their disadvantage in doing management in English Japanese companies have to strive even harder for achieving excellent managerial resources such as global stature of their brands and the world's most competitive production systems uniquely created by these companies. They are also needed to inspire the entrepreneurship of the local managers of overseas subsidiaries as well as the innovative spirit of local engineers.

We believe that this argument about English applies to ERP as well. From a wide perspective, ERP is a big wave of today's business and nobody can resist the force it has unleashed. Unfortunately, the managerial style of Japanese companies does not fit ERP softwares that models American and European business practices, although they have to incorporate ERP. This is a big dilemma and tragedy for Japanese companies.

## **COMPANIES INTERVIEWED**

Sumida Corporation, Mitsubishi Corporation, NYK (Nihon Yusen Kaisha), Siemens, Matsushita Electronic Components, Price Waterhouse Coopers, Advantest, Orbic Business Consultant, Sumitomo Pharmaceuticals, The Japan Research Institute, Toyota, Globia Interantional, Denso, Business Information System Architect, Asprova, SAP Japan, Japan Oracle, Takeda Chemical Industries, Works Applications

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<sup>13</sup> Yoshihara, Okabe and Sawaki, 2001.

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