

Compatibility between ERP and Japanese-style management

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ERPと日本的経営の整合性

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Abstract

本論は、ERP（統合業務パッケージソフトウェア）に焦点をあてて、情報技術と日本的経営との整合性について考察するものである。ERPは、経営の効率化を目指して、人事、財務、管理会計、生産、調達、在庫、販売などの業務データを統括的に管理する情報システムを構築するためのソフトウェアである。ERPを導入することにより、業務処理コストの削減、リアルタイムでの業務内容の把握、データの一元管理などが可能となる。ERPを導入する日本企業が急増しているが、導入・維持コストに見合うだけの成果が上がらないケースも多い。これは一つには、ERPが経営とくに業務にもたらす影響について日本の経営者が十分に理解していないことに原因がある。ERPとは本来、欧米企業のベストプラクティスをモデルとした汎用ソフトであり、業務をグローバル標準化するものである。一方、日本的経営の大きな特徴は、ヒトや情報などの経営資源が長期にわたって企業内に蓄積され、生産などの業務が企業独自のものとして洗練され、その企業独自の業務が競争優位の源泉となっている点にある。このように、日本的経営とERPの基本的思想（業務の標準化）とは相反するのである。世界中でERPの導入が進む中、日本企業は、ERPによる経営のグローバル標準化を目指すべきか、あるいは日本的経営のメリットを保持すべきかの難しい選択に迫られている。実際、過去数年間に製薬、電気、石油等の企業で国際的なM & Aが行われているが、合併を行う企業同士は同一のERPシステムを使い、業務が標準化されていることが多い。これらの企業では、競争優位の決定要因として、競争力のある製品を生み出す製品開発力が決定的に重要であり、生産・販売などの業務の効率性はあまり重要でない。したがって、製品開発には汎用的なERPを導入せずに自社独自の情報システムを開発して使うが、競争力の差別的・決定的な要因でない業務には企業独自の業務システムを構築せずにERPを導入している。ERPによってシステムのコスト削減を図りながらグローバル標準経営をおし進め、国際競争力を高めるという戦略を取っているのである。経営者は、ERPの基本的思想を理解し、自らの企業の経営のあり方と適合するかどうかを慎重に検討すべきである。本論では、統計データ、インタビュー調査、関連文献などにもとづき、ERPと日本的経営の特徴を示した上で相互の整合性を議論し、日本企業におけるERPの活用の現状を明らかにしながら、日本企業に適合的なERPとはどのようなものかを提案する。ERPを取り上げた従来の研究は、情報システム論における議論がほとんどであり、日本企業の経営や組織との関連付けで議論した研究はほとんど存在しない。このような意味において本研究は今日的意義が大きいと考える。

Key words

enterprise resource planning, Japanese-style management, packaged software, competitive advantage, network externalities

1. Overview and purpose

Today, ERP is one of the most important and widely used corporate information systems worldwide and the number of companies installing ERP is increasing rapidly. Many Japanese companies have also rushed to install ERP. According to a survey, the number of Japanese companies installing ERP increased by 17.2 points between 2002 and 2007. ⁽¹⁾ Another survey shows that the

total sale of ERP package was 117.8 billion yen in 2007, which was 13% increase over the previous year. ⁽²⁾ Separate from corporate communication systems using e-mail and the internet, ERP is a kind of computer information system designed to serve business operations as varied as production, sales, purchasing, accounting, and personnel management. It is not an exaggeration to say that today's basic business operations cannot be executed properly without the help of such information systems.

Judging from its name, ERP was originally developed as a tool to facilitate managerial resource planning in a highly efficient way. However, the term is currently used independently of

its original meaning. As is evident from its Japanese translation, “togo-gyomu package software” (“togo-gyomu” means “integrating business operations”), it is a kind of packaged software which is used to integrate business data collected from different business operations of a company. The merits of ERP are fully appreciated only when it is used for all aspects of a company’s operations to integrate every single piece of data. However, there are other kinds of software, also called “ERP”, which have been developed for more limited uses in such operations as accounting, personnel affairs, and sales. Therefore, although we believe that ideally the term ERP should refer to systems covering the business operations, we use the term in both senses including the latter narrower one.

In the early stage of the introduction of the ERP in Japanese market, mass-production-based manufacturing industries such as pharmaceutical, chemical, and oil industries installed ERP and utilized it quite extensively. However, unfortunately, except for these few early success cases, many of the other companies which installed ERP in later stages do not seem to fully appreciate its merits, and some have even ended up wasting money.⁽³⁾ This situation is more or less the same in other countries as well. Yet it is particularly serious in Japan partly due to a lack of understanding among Japanese corporate managers about the concepts of the information systems and how they can be used within their uniquely Japanese managerial style.

Our major objective, therefore, is to provide some useful suggestions to Japanese corporate managers, including top executives, researchers and academics about how corporate information systems should be managed. The decisions regarding which system to construct or how to use it cannot be left in the hands of engineers alone. However, unfortunately, the higher-level managers and executives do not have sufficient technical knowledge to make appropriate decisions about corporate information systems. Their misjudgments sometimes lead to serious disasters such as in the case of Mizuho Financial Group which suffered a breakdown of their whole ATM system in April, 2002. The problem we are trying to argue is essentially the need for compatibility between the national managerial style and information technology.

Although ERP has become a popular research topic among academicians, most of the studies have been done within the framework of management information systems theory. Not much writing has been done from the standpoint of managerial or organizational studies. Furthermore, there seems to be very little interaction between these two academic perspectives. In view of this situation, we intend to approach the issue from both fields of study and to build a bridge between the two academic fields. The basic research methods in this paper were analysis of statistic data, literature survey and interviews. Some of these interviewees are listed at the end of this paper.

2. The difficulties of ERP for the management of Japanese companies

2.1 The idea behind ERP and benefits it brings

We would like to look at some basic concepts of ERP. First, ERP is based on the concept of standardization of business practices. As mentioned, ERP is a type of packaged software for multiple users. This means that the business practices of user companies become steadily more similar to each other’s, and the peculiarities in business practices of an individual company are reduced.

Secondly, ERP controlled business operations cannot provide competitive advantages for one user over another. It is extremely difficult or even almost impossible for the users to differentiate their business operations from those of competitors who also use ERP. Thomas Davenport (2000) says, “... 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 (Enterprise System, same as ERP) implementation would not include manufacturing systems, managers knew that interfacing proprietary systems 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.”⁽⁴⁾

This view is shared by some consultants as well. Chikayasu (2001) says, “The business domains that companies need to differentiate themselves from one another are unrelated to operations. Companies may even forget about operations and keep operational activities exactly the same as those of their competitors by installing standardized general-purpose systems. They should instead concentrate their resources on other business domains which need to be more competitive.”⁽⁵⁾ For example, most large pharmaceutical companies in Japan are using ERP in their manufacturing operations because they recognize that manufacturing is of much less significance for them than are research and development where their competitive edges exist.

Thirdly, ERP drives outsourcing of computer systems and business practices. For a company to use packaged software purchased in the open market means that their computer systems are outsourced instead of being developed in-house. Therefore, business practices based on ERP are standardized by third parties.

Fourthly, related to the previous feature is the pattern of utilizing external managerial resources. Since ERP is developed by outside vendors who specialize in computer information systems, using ERP means utilizing external managerial resources in the form of the technology, know-how, and human resources that are incorporated in the computer information systems. Such resources are provided by system integrators (SI), consulting firms, and software vendors.

The fifth is that the spread of ERP produces so-called network externalities. Network externality means that, as the number of users participating in a network increases, the advantages for each

participant will increase as well as the value of the network as a whole. The network externality comes from the fact that ERP has been installed by a large number of companies, including big American and European firms. This is parallel to the network externalities for Microsoft's "word". Although there is a Japanese software system called "Ichitaro" which is considered for word processing in Japanese, most Japanese users choose "Word" because it is more wide spread. "Ichitaro" is used by Japanese who exchange data only with other Japanese who have this software. The same advantage is enjoyed by ERP. When companies try to exchange data and conduct electronic transactions with other companies, it is much easier for them to do so if they all use ERP; this is obviously more efficient than each company using its own unique computer information system. The maintenance of each company's computer system can also be done more easily because there are more ERP specialists than there are specialists for a single company's specific system. Moreover, companies can request assistance from third parties, including vendors, system integrators, and consultants. With these advantages, ERP is becoming the world standard.

The users of ERP can usually appreciate various benefits. A survey shows that what the users most expect to achieve by introducing ERP are (1) to share and utilize information; (2) to cut the cost by increasing efficiency; and (3) to control data comprehensively.⁽⁶⁾ Chikayasu (2001) says, "With ERP, corporate sales managers and executives can check the sales values and sales margins based on standard costs, and these data can be traced back for weeks and months and aggregated on a global basis. Since such accounting data are created and stored at the time of the shipment and invoicing of merchandise, you can look at the sales volumes or cash flows almost anytime you want. You can also make estimates for the next week or next month based on the most updated data."⁽⁷⁾ Here by "business data", he means the data that is generated at the same time that a business activity is executed. The kinds of data important to sales activities include revenues, customers' names, kinds of products, prices, and times and dates for all sales. For all these data to be used effectively, ERP must enable the companies (1) to use all possible data, including for sales, manufacturing, and purchasing; (2) to quickly obtain and analyze the necessary data; and (3) to collect and analyze data from both domestic and overseas markets. The important factor is that, as we have mentioned, the full value of ERP can be fully appreciated only when it is installed in all or most areas of business operations.

ERP is also beneficial for business reform. ERP is based on the best business practices of top US and European companies. Companies installing ERP can thereby assimilate these best practices of successful Western companies. This means that when the levels of certain business practices of a company are lower than those of "the best practices" internationally, they can improve their overall business practices with the help of ERP.

Additionally, the user companies reaching the capacity limits of their existing computer information systems, called "legacy systems", can overcome this problem by installing ERP. Numbers of companies are facing this problem. It can only be resolved either by outsourcing the development of new computer information systems to system integrators such as Fujitsu, NEC, or IBM, or by installing ERP software.

2.2 Characteristics of Japanese-style management

Although Japanese-style management has been defined in many different ways, we would like to define it here by the premises of the business practices of Japanese corporate management. The Japanese-style management has some characteristics, among which the following three are the most crucial in considering its relation with ERP.

The first concerns the accumulation of company specific managerial resources inside each company. Itami (1987) argues that human networks are the chief strength of Japanese organizations in which information and decision-making are shared among all employees. Since there has traditionally been little fluidity in the Japanese labor market, newly employed young people have usually stayed with the company until reaching retirement age. This enabled them to establish in depth human relationship with other organizational members and also to acquire managerial knowledge, technology, know-how, communication skills, and familiarity with the specific corporate culture over long periods of time. These factors are passed on to new employees mainly through on-the-job-training and face-to-face contact, which is almost like a craft apprenticeship.⁽⁸⁾ Thus, employees' work practices and procedures cannot be easily standardized and documented in job descriptions and business manuals.

Since corporate information systems are developed based on job descriptions, Japanese employees' jobs cannot be fully reflected in the company's information system. Contrarily, in the US and Europe where labor mobility is much higher than Japan, work practices and procedures need to be strictly standardized and job descriptions and business manuals are more rigidly implemented in order to easily and quickly replace employees. In this respect US and European companies can greatly benefit by ERP as long as they standardize work practices to a maximum.

There is indeed a merit in the Japanese traditional employment system. Because the employees are not rigidly controlled by manuals or information systems, they have more flexibility in responding to customers' needs and in making changes in managerial environments. However, the work attitudes of young Japanese are rapidly changing due to the globalization of business and the resulting restructuring of the Japanese economy. Young Japanese are less committed to work for the same organization for life and job hopping is becoming more popular. In the future, companies will likely to introduce job manuals to standardize more jobs and to install information systems based on those job manuals so

that the firms can replace employees at any time. This will make it more difficult for Japanese companies to retain a management style which depends so much on internal accumulation of managerial resources unique to each company. We believe that this is one of the reasons why Japanese companies will sooner or later introduce ERP.

The second characteristic is that business operations are viewed as the chief source of competitive advantage at Japanese companies. It is often pointed out that Japanese companies, in general, have outstanding competence in operational activities, although their strategic planning is often of a lower quality (e.g., Mishina, 2002). Many companies argue that their competitive edge lies in their business operations. With regard to manufacturing, for instance, “genba”, their daily effort to improve operations, leads to constant reduction in production costs and rejection rates, and to the enhancement of product quality. All these improvements are the main source of competitive advantage. Globally, however, competitiveness comes not only from operations improvements but also from the development of new products, superior business strategies, brand dominance, and strategic alliances, and mergers and acquisitions. Many companies in other countries focus on these other sources of competitiveness while merely matching the business practices of their competitors in operations such as manufacturing.

The third distinctive characteristic of Japanese management is a dedication to continuous improvements at the work sites. This is particularly common on factory floors. Japanese factory workers are expected to contribute ideas to improve their daily operations based on in-depth suggestion systems or Quality Control circles. These ideas about small improvements are suggested almost every day and most of them are actually implemented.

2.3 Conflicts between ERP and Japanese-style management

From what we have described in the preceding section, it is evident that the premises of ERP and Japanese-style management are quite different from each other and may be almost mutually exclusive. ERP has posed two serious challenges for Japanese corporate management. First, because off-the-shelf packaged software is usually designed for multiple diverse users, specific needs of Japanese companies are not always fulfilled. Second, most ERP software packages have been based on the business practices of Western companies, for their human resource management, accounting, sales, and manufacturing systems. Although some ERP software packages which are based specifically on the business practices of Japanese companies can now be found in the market, the volume is still limited.

As a matter of fact, such problems are not seen only with ERP but with any other form of automation. By replacing manual work with machines and robots, companies can enjoy lots of merits such as a higher speed of manufacturing, lower defect rates, and the

reduction of dangerous work for humans. However, automation leaves less room for floor workers to make improvements on the shop floor, which is considered to be strength of Japanese companies. Therefore, there are both merits and demerits in traditional Japanese-style manufacturing based on the worker's commitment for improvement and in the introduction of machines and robots for automation. This presents a dilemma for Japanese companies.

Japanese companies have dealt with these problems by taking the following steps: (1) partially introducing machines and robots on limited production lines, (2) having floor workers, managers, and corporate engineers participate in the process of introducing machines and robots, and (3) changing and modifying the automation systems in short periods of time to respond to the situations of the production sites. Regardless of such efforts, many Japanese companies are now in a situation in which they feel that they have to introduce ERP. ERP offers tremendous benefits to companies such as more effective utilization of business data, easier exchanges of business data with other companies, and bypassing problems from outdated internally-developed information systems. These benefits are indispensable for Japanese companies to resolve their problems.

Before ERP was introduced into the market, Japanese companies had been developing their corporate computer information systems by themselves. Even when they outsourced software development to vendors, it was on a custom-order basis intended to create systems fitted to specific business practices of each company. Unlike hardware, software seldom goes through overall revisions. Changes are usually done in minor cases by eliminating unnecessary functions, adding necessary functions, and revising existing functions. Companies usually try to keep using the same software over ten or twenty years by making patches one after another. As a result of repeated patchwork, software tends to grow into large, complicated systems which are sometimes called ‘spaghetti systems’ depicting the congestion of connections. Such old systems cost a lot for maintenance, revisions, improvements, and changes in response to changes in business practices.

In-house information systems are also more costly in terms of human resources. Companies need specialists to construct, revise, and maintain state-of-the-art information systems. However, highly skilled engineers who can do such work are not easily found. Corporate engineers are expected to meet many other demands of their companies, so they do not have much time to keep up with rapidly changing new technology. It is, therefore, difficult for many Japanese companies to have information system specialists with up-to-date knowledge. This shortage in skilled computer engineers is compounded by growing demand due to the rapid increase in on-line transactions in all domains of business. So, companies have to get specialists from the outside.

Internally developed systems also run into limitations due to technology itself. Since the end of the 1980's, information systems have evolved from traditional general-purpose computers to

personal computers networked by medium-sized servers. PCs linked by servers are superior to general-purpose computers because of their cost effectiveness and greater independence from specific hardware. We recall how companies facing the Y2K problem frantically rushed to get help from computer engineers specializing in general-purpose computers. From the standpoint of both technology and human resources, internally developed information systems using general purpose computers are no longer realistic.

To summarize what we have discussed above, we may conclude that many Japanese companies are now in a situation in which they have to install ERP even though ERP is, by its nature, quite unsuitable to the traditional management style of Japanese companies.

3. How ERP is used at Japanese companies today

3.1 Installation by Module

ERP can be installed in either all or just some of a company's business domains. Although it is ideal to install it in all of the operations, many of Japanese companies install it only in certain domains, such as accounting, human resource management, and sales. This limited use of ERP by Japanese companies is just like the way people generally use their own personal computers. PCs have many functions, but most people use only a few of them, such as word processing or connecting to the Internet.

The use of ERP in Japan differs according to business domain. There is a large gap between usage in office work and other operations. Because ERP was originally developed for accounting, most users install it first in their accounting departments. Accounting and financial departments are major users of ERP: in 2007, 41.1% of Japanese companies had it in their accounting departments and 40.8% in their financial departments. Human resources departments came next with 27.1%. Installation in domains related to manufacturing has been limited. Our survey covering the period between 1994 and 2003 shows that although ERP was designed to serve all business, only 110 companies, or about 36% of the total number of Japanese ERP users, had installed more than four ERP modules.⁽⁹⁾ Another survey by ERP Forum Japan and Nikkei BP Consulting Inc. shows that compared to these areas related to office work, those related to production, sales, and procurement used ERP much less: 18.5% in sales and warehousing departments, 18.6% in purchasing departments, and 15.7% for production operations.⁽¹⁰⁾ Similar situation can be seen in the US and Europe as well. But the reasons are different for Japanese companies: they consider manufacturing, sales, and purchasing as quite vital to their competitive advantage.

Let us look at a few corporate cases. The Toyota Automobile Company, which is well known for its Toyota production system, uses a computer system which it developed by itself. Toyota have no plans to introduce ERP in manufacturing. One of the reasons Toyota does not use ERP is that no currently available ERP soft-

ware can deal adequately with Toyota's global production activities. The scale of Toyota production is too large to be comprehensively covered by existing ERP software. Perhaps more importantly, Toyota officials consider their production system to be a competitive advantage. The strength of Toyota lies in its day-by-day efforts to improve production activities, to reduce the rate of rejects, to increase productivity, and thus to cut costs. Toyota officials believe that their knowledge about manufacturing operations is the main source of their competitiveness and that their efficient production system, called "kanban", surpasses what the U.S. and European companies can do with ERP. Therefore, Toyota is unwilling to reveal details of its "kanban" system to the competitors. Toyota's investment of about 200 billion yen – about 8.5 billion dollars – annually on information system is spent on improving its own production system throughout their global production processes so that it can reinforce their cost competitiveness.⁽¹¹⁾

Denso, a supplier of components for Toyota, also considers manufacturing as the source of its competitiveness. It uses its own production system not only in Japan but also in overseas factories. At its Tennessee factory in the US, for example, it uses its internally developed Co-operative Information System for Global Manufacturing (CIGMA) as a production system.⁽¹²⁾ Although Denso does not have a plan to use ERP in its manufacturing in the foreseeable future, it is planning to install one ERP module in its accounting department, presumably for the purpose of conducting consolidated accounting more effectively with Toyota, which is also using ERP software in its accounting department. In contrast to the case of Denso, Bosch, the biggest competitor for Denso, is reported to have installed SAP's R/3 package of ERP software in its manufacturing. Bosch seems to consider that its competitiveness is not based in production but rather in the development of new products. So, for product development, it uses an in-house information system.

Takeda Pharmaceutical, largest pharmaceutical company in Japan, has installed SAP's R/3 in some business domains including manufacturing. For pharmaceutical companies, the most important, indeed almost the only source, of competitiveness is the development of new drugs. Other domains, which Takeda calls "logistics", covers purchasing, manufacturing, quality control, shipment, and distribution of products. These are far less important.⁽¹³⁾ Takeda's official told us in our interview that they would not use money in any fields other than Research and Development. According to a document from Takeda's information systems department, "... logistics is not the domain in which we should compete. Business processes such as logistics should be simplified and standardized. Instead, we should compete in research and development." It also says, "As for the domains where we do not need to compete (the areas with no added values), investment should be kept as small as possible..."⁽¹⁴⁾ Although Takeda uses ERP in manufacturing and Toyota and Denso do not, these three

companies share the same policy regarding the introduction of ERP. They are all installing ERP in unimportant business domains but not in strategically important areas.

Another reason for many Japanese companies not installing ERP in domains such as manufacturing is that they try to accumulate small improvements at the individual work sites. At manufacturing sites of Japanese companies, many ideas for improving operations are suggested by line workers and implemented by lower managers on daily basis. These small improvements steadily reduce the number and cost of rejects in manufacturing processes. Similar efforts are made at work sites in other business domains such as sales, purchasing, and distribution. All these improvements in operations lead to changes in business data, which means that computer information systems themselves must be constantly updated. Adapting computer systems to these changes in business practices is, of course, different with an old spaghetti system of continual patches and an ERP system. With an in-house system, corporate engineers take charge of studying the feasibility of, and then implementing changes in the system. On the other hand, with ERP, corporate engineers can only make minor changes such as resetting parameters. They cannot handle crucial changes which have to be outsourced to ERP specialists. This means that small improvements on business sites are inhibited if the company uses an ERP system in business practices.⁽¹⁵⁾

There is a third source of difficulty in responding to changes in business practices with ERP. When modifications or add-ons are done on ERP software, all other kinds of related software also have to be changed at the same time. The more changes are made, the more difficult it becomes to depend on maintenance services from ERP vendors.

3.2 Making changes in ERP software

As Davenport (1998) writes, Japanese users tend to buy ERP software with many additional functions.⁽¹⁶⁾ SAP Japan, the Japanese subsidiary of the German company, says that the most common way of installing ERP software among Japanese companies is either by stand-alone modular units or by customized add-ons to the whole system. SAP has been telling their Japanese clients that it is necessary to install ERP in all of their business domains without any add-ons if they want to fully utilize the advantages of ERP.

Advantest, a Japanese manufacturer of machines for producing semiconductors, has installed ERP supplied by Globia International, a Japanese ERP vendor and Fujitsu's subsidiary. Company president Ohura says, "We will accommodate our business practices to ERP. We will not allow the operation sites to keep using their own methods."⁽¹⁷⁾ However, in our interview, he told us that, despite his order, employees still made 287 requests for modifications; 51 out of these 287 requests had to be finally accepted.

Why do Japanese companies make so many modifications?

One reason is that many business practices of such Japanese company are highly specific to that company. A survey shows that the largest number of respondent companies (44.7 %) chose ERP because of its adaptability to corporate specific operations.⁽¹⁸⁾ This applies to their business practices as well. Each company has its own business practices which are not easily standardized. Additionally, many companies think that their business practices are at least as good as or even better than the US and Europe, particularly in the domain of manufacturing.

The second reason is that the business practices of Japanese companies are different from those of US and European companies for which ERP was designed. Many practices common in Japanese corporate business – particular methods for accumulating sales revenues, purchasing cost, and customary retirement pension plans for employees, widespread company housing systems and traditional year-end salary bonus – simply do not exist in ERP software package. According to a questionnaire survey conducted in 2001 against Japanese ERP users, when asked about the functions that they requested from vendors to improve on current ERP software, 51.8% of the respondents answered "standard functions suitable for [Japanese] business practices", although the largest number of respondents (59.0%) requested a "lower price".⁽¹⁹⁾

3.3 Low expectations towards ERP

As a matter of fact, few Japanese companies are fully satisfied with the results of implementing ERP. On the contrary, many of them criticize or complain about ERP. According to a questionnaire survey to Japanese ERP users, 42.2% of the respondents were satisfied with the introduction of corporate information system while 63.4% were dissatisfied.⁽²⁰⁾ In one of our interviews, a Japanese consultant specializing in ERP told us, "If the system works at all, then we consider that the project was successful." This view of ERP seems to be generally shared by most Japanese specialists in information systems. They agree on the view that, if ERP is actuated and the company's workflow still runs smoothly, then the installation of ERP was successful. They do not seriously consider whether business efficiency is enhanced or whether business data is utilized more efficiently. The ratio of profit from against cost of the investment in ERP is not figured out either.

We would like to point out that Japanese companies generally expect ERP to help generate data, such as sales charts or accounting reports, at the same level as is done by existing information systems. Although ERP is designed to increase efficiency in utilizing business data, Japanese companies do not seem to pay much attention to this potential. This is partly because they install ERP only in limited business domains, but the full potential of ERP can be fully appreciated only by company-wide utilization. Besides that, few higher-level managers have any ambition to use business data more efficiently than they do today. Actually, most users do not even ask what kind of data can be obtained from ERP to solve certain problems nor do they request data to be provided

on a real time basis to make important business decisions more quickly.

3.4 How Japanese companies deal with ERP

There are three ways of installing computerized information systems. With in-house development, the information systems department in each company develops its own original information system. With outsourcing, outside vendors such as Fujitsu, NEC, or IBM develop company-specific systems. And now, with ERP installation, companies can simply purchase packaged software. Many companies simply choose one of these three options. In-house development is the traditional method of installing information systems in Japanese companies. But large banks are beginning to switch from in-house development to outsourcing. A limited number of companies use ERP only. These companies include Advantest, Yodobashi Camera and Maruhachi Muramatsu. Sometimes, companies use more than one source. For example, Takeda Pharmaceutical Company uses its in-house system for domains in which they compete with other companies but it uses ERP in domains which are not considered as sources of competitive advantage. In various other companies, company specific systems are developed by an outside company but ERP is also used again for domains not deemed as strategic.

The number of companies choosing ERP in combination with either in-house or outside vendors' systems will likely to increase in the future. For one thing, companies are limited in their capacity to deal with technological advancement and the various tasks that are generated by new technology. Because the companies' information systems departments are not considered as core business domains, the workforces of these information departments will likely not be increased very much. Thus, in-house capacities will not grow commensurate to the increasing needs for computerized information systems.

4. Discussion: What is the ideal use of ERP for Japanese companies?

Japanese-style management and ERP are based on different business outlooks. Given this central problem, what ERP would be ideal for Japanese corporate management? We believe that three issues must be considered in thinking about the ideal use of ERP.

The first concerns the relationship between the management of business data and business processes. The primary objective for Japanese companies installing ERP has been to gain the ability to overcome bottlenecks arising in their in-house systems as these have reached full capacity. Two other objectives have been to use business data more effectively and to improve business activities. Most companies are not very concerned about these last two objectives. They have no intention of using business data in more sophisticated ways. They only expect ERP to provide the same data as they have gotten from their existing systems. Even if they do try to use the data more efficiently, they do not change the

existing business processes or practices. The variants of ERP that best fit Japanese companies are those that are easily modified and that do not require any changes in business processes. In effect, Japanese management often wants to compromise between the universality of ERP and the specificity of a customized system.

The second issue is the preference for module-based installation over integral installation. Users often want to install ERP software module by module starting from those business domains where installation work is fairly easy. They also wish to use ERP to overcome limitations in their existing systems and, or, to utilize business data more efficiently. Considering these needs, module-based ERP is preferred over integral installation. Module-based ERP can be installed separately in each business unit, such as accounting, human resources, manufacturing, and sales. With this approach, any changes made in business practices in one department do not interfere with ERP software installed in other departments.

The third problem is the difference in management styles for which ERP has been designed. ERP designed for Western companies cannot adequately deal with the business practices of Japanese companies. ERP designed particularly for the business practices of Japanese companies is more beneficial to them than variants designed for US and European companies because they want to retain their current business practices.

Considering the above three points, we believe that the kind of ERP most suitable to Japanese-style management should have the following three characteristics: (1) separation of data management and business process; (2) module-based installation; and (3) designs specifically for the business practices of Japanese companies.

Unfortunately such a software package is not what is being installed by many Japanese companies. Our survey shows that the most widely used ERP package in Japan between 1994 and 2003 was SAP's R/3, which took 51 % of Japanese ERP market.⁽²¹⁾ Another survey conducted in 2007 shows that SAP still takes the largest share (20.6%) in Japanese market.⁽²²⁾ SAP's software did not have enough of the above-mentioned three characteristics required by Japanese companies. However, when Japanese companies started introducing ERP in the 1990s, they had no other choice but to adopt SAP's R/3 because it was the only useful ERP software on the market at that time. SAP's R/3 expanded in Japan with so-called network externalities. Today, other kinds of software are increasing their shares: SuperStream (8.9%), GLOVIA-C (7.7%), OBIC 7 (7.1%), COMPANY (5.8%) and Oracle's E-Business Suite (5.2%). However, SAP's software still takes the largest share of the Japanese market.

SAP's software also has the largest share in the world. Therefore, companies using this software can enjoy the merits of exchanging data globally with a great number of companies. Japanese companies now have to make difficult decisions to choose between two contradictory benefits: the network externalities which

drives the global expansion of their business, or the strength of their traditional management style which is particularly seen in manufacturing operations.

The decrease in the number of SAP users over the past four years indicates that some companies did not choose the strategy of becoming a global company. There has been increase in the number of companies doing M&A (mergers and acquisitions) in some industrial sectors such as pharmaceutical, petroleum and electric. These companies use ERP and they are trying to enhance international competitiveness by standardizing their management. This seems to prove that ERP has now become one of indispensable factors for becoming a global company. Those companies that do not actively seek to be global companies do not need to install SAP's ERP package. Instead, these companies install other kinds of packaged softwares such as GLOVIA and COMPANY; these software packages suit the needs of such companies.

5. Conclusion

In this paper we have argued that ERP and Japanese-style management are basically incompatible with each other, but that Japanese companies probably have no choice other than trying to find some ways to adapt to the new technology. They need to introduce ERP because it offers advantages in enhancing business efficiency. Most immediately, their existing information systems are often too old and cumbersome to permit easy addition of new functions. It takes lots of money and labor to maintain old systems and it is even more costly to build new systems in-house. However, ERP, by its nature, forces the standardization of business operations even in such areas as manufacturing where Japanese companies want to retain their individuality. This is crucial dilemma for Japanese companies. The essence of Japanese-style management is the accumulation and development of intra-organizational managerial resources, while the new style of management based on IT is directed towards utilizing extra-organizational managerial resources. The gap between the two is large, so, Japanese companies face a serious dilemma.

We have conducted this research partly because we think that business people and management scholars need to be more aware of the basic tensions between the widening use of IT and a particular national style of management. When introducing ERP, corporate manager should more thoroughly and carefully consider the merits and demerits as well as the feasibility of using it.

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Notes

- (1) The research was conducted against 504 companies in 2002 and 432 companies in 2007. (ERP Forum Japan/Nikkei BP Consulting Inc., 2007, p.125).
- (2) The research was conducted between July 2007 and February 2008 against 23 ERP vendors in Japan. (Yano Keizai Kenkyusho, *Research Express, saishin Chosakekka no samari ERP Shijofoko ni kansuru Chosa* [Research on the Trends of ERP Market]. Retrieved March 26, 2008 from <http://www.yano.co.jp/press.php/341>).
- (3) According to a survey by ERP Forum Japan/Nikkei BP Consulting, Ltd., when asked about the reasons for stop using ERP shows, about 35.1 percent of the respondents points out the difficulty of understanding the effect of ERP and 22.0 percent points out the lack of managers' understanding and leadership. (ERP Forum Japan/Nikkei BP Consulting Inc., 2007, p.132).
- (4) Davenport, 2000, p.109.
- (5) Chikayasu, 2001, p.95.
- (6) ERP Forum Japan/Nikkei BP Consulting Inc., 2007, p.89.
- (7) Chikayasu, 2001, p.170.
- (8) Yashiro, 1997.
- (9) This survey is based on Yokota (2002) and data is updated. Data is drawn from Nikkei Telecom 21. Companies surveyed are those introduced in the articles on four *Nikkei* Newspapers (*Nihon Keizai Shinbun*, *Nikkei Sangyo Shinbun*, *Nikkei Kinyu Shinbun* and *Nikkei Ryutsu Shinbun*) and two *Nikkei* magazines (*Nikkei Computer* and *Nikkei Joho Strategy*) during the period between January 1994 and march 2003.
- (10) ERP Forum Japan/Nikkei BP Consulting Inc., 2007, p.76.
- (11) *Nihon Keizai Shingun*, June 10, 2003.
- (12) Fujiwara and Yoshihara, 2003, pp.213-230.
- (13) Suzuki and Yasuda, 2001.
- (14) Lojisutikku Shisutemu deno R/3 Katsuyo Jirei [A case study on R/3 Installation in Takeda Pharmaceutical Company's Logistic System] (Document obtained from Information Systems Department of Takeda Pharmaceutical Company Limited), April 22, 1999.
- (15) Fujimoto, 2001, p.192.

- (16) Davenport, 1998.
- (17) Uesato, 1999, p.14-17.
- (18) ERP Forum Japan/Nikkei BP Consulting Inc., 2007, p.158.
- (19) ERP Research and Promotion Forum/Information Center, 2001, p.19.
- (20) ERP Forum Japan/Nikkei BP Consulting Inc., 2007, p.123.
- (21) See note 8. The total number of surveyed companies was 313. Some companies install ERP software packages provided by more than two vendors. PeopleSoft was purchased by Oracle in January, 2005.
- (22) ERP Forum Japan/Nikkei BP Consulting Inc., 2007, p.152.

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