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**An analysis of the current and future ERP
market**
-with focus on Sweden

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Executive Summary

The ERP, Enterprise Resource Planning, market is relatively new and has grown very quickly lately. The three main reasons for the growth have been globalisation, Year 2000, and the need for better information integration. There is also a trend to replace older customised systems with standard applications such as an ERP system. The introduction of the Euro has not, as in other European countries, been a business driver in Sweden.

We believe that there will be a short stagnation during the second half of 1999 until the second quarter of 2000. The vendors will be most affected of the slowdown due to decreased sales. The consulting firms, however, will have much work in their clients' preparation for Year 2000. We believe that the market will continue to grow strongly after the millennium, but probably in a different way due to new market drivers.

After the millennium we believe that the technical point of view will change. The reason for acquiring an ERP system will turn towards a more strategic approach. Companies are forced to deal with Year 2000 compliance and do not have time for business development right now. In the future, companies that consider an ERP system will see it as a strategic opportunity to strengthen their competitiveness, an instrument to improve the company's process flows. Existing customers will acquire complementary modules, components, to increase the strategic use of the ERP system. ERP and third-party vendors are increasingly offering new products in this area, such as Decision Support Systems.

The ERP market among small and middle-sized companies has not yet been as exploited as for the largest companies. The large ERP vendors are now heading for this customer group and have to offer simpler solutions that are cheaper, pre-configured and easy to install. It is likely that the Euro conversion will have a great impact on the ERP market and be a business driver for ERP sales to small and middle-sized companies. Outsourcing of the ERP environment is another possible market opportunity.

The ERP vendors, especially SAP, and the consulting firms have received much criticism for delayed and expensive projects. The most important factor for a project's success is the client's devotion to and responsibility for the ERP project. Other implementation success factors are; appropriate resources are dedicated full-time; enough time for and content of training; the ability to manage the change; and the right level of business process re-engineering throughout the project.

The ERP market has been a very successful playground for the consulting firms. Their problem has been to find qualified employees. Lack of experienced people has gained a lot of attention on the market and the most important factors when choosing an ERP business partner is reference projects and qualified consultants throughout the whole project.

The new services that the consulting firms will have to deliver in order to be competitive in the future are: management consulting skills, specific industry knowledge, Euro knowledge, E-business knowledge, outsourcing capabilities.

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We wish and hope that this thesis will be of great value for CSC.

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1 Introduction

1.1 Our mission

On behalf of CSC Sweden we have performed an analysis of the current and future Enterprise Resource Planning (ERP) market, with focus on the Swedish market. We have described the ERP system, the ERP market of today and how the trends can change the current market situation.

1.2 Background

This thesis work is the last part of our four and a half years of studies at the Royal Institute of Technology, Stockholm. We have studied Mechanical Engineering, majoring in Industrial Economics and Management and Computer Systems respectively. Since we both have interest of Information Technology, technology and economics, we found the area of ERP systems very interesting. Therefore we started looking for an interesting subject, related to ERP, to work with. This process included asking ERP-related companies if they had any interesting investigations where they wanted our help.

1.2.1 CSC

CSC, Computer Sciences Corporation, is about to enter the ERP market in Sweden. CSC Sweden is at present starting a new business area, a SAP unit. CSC is a global partner to SAP, a vendor of the most sold ERP system in the world, R/3. As a consulting partner, CSC Sweden will implement the R/3 system in Swedish companies that have purchased the system from SAP. CSC has experience of implementing different ERP systems in countries around the world, but has little experience of the Swedish ERP market. Therefore, they wanted us to perform an analysis of the current and future ERP market in Sweden.

CSC, Computer Sciences Corporation, was founded in the U.S. in 1959 and is today one of the world's leading IT consulting firms. Its broad-based services include management consulting in the strategic use of information technology, systems integration, and outsourcing. CSC has a staff of 47 000 employees in 700 offices in major cities around the world and generated revenue of \$7.4 billion in 1998. CSC has more than 1 400 SAP consultants world-wide.

CSC Sweden is located in Stockholm and has about 100 employees. Its major business activities are in the areas of telecom, financial services and from now on also SAP. CSC will become one of about 20 SAP consulting partners that implement the R/3 system in Sweden.

There are several reasons for CSC starting their SAP unit in Sweden. The most important ones are: CSC wants to offer their international clients a possibility of global implementations of SAP, Sweden included; the ERP market is a fast-growing market where there are possibilities of large profits.

1.3 Purpose

The purpose of this thesis is to analyse the needs that have to be met by CSC Sweden to be a competitive consulting firm on the future ERP market. The thesis is supposed to give CSC a better knowledge of the current and future market situation and moreover to be a valuable guidance for CSC when forming its future ERP strategies. The thesis shall also describe important factors when working with ERP (SAP) clients during the ERP implementation etc. Another purpose with this thesis work is to be a helpful information for employers at CSC who are not directly involved in the SAP business.

1.4 Limitation of scope

This section will describe the limitations made in this investigation. We have been allowed to extend the work as far as we wanted since we did not have any demarcations from CSC or the Royal Institute of Technology.

The first limitation that we made was that in our market study we only investigated ERP systems and companies working with it, and not information systems as a whole.

Another delimitation that we made was that we have studied only the world's five largest ERP vendors and the five largest ERP vendors on the Swedish market. We made this limitation not to drown in the work of investigating the vendors.

Since CSC is primarily interested in SAP clients' behaviour, compared to other ERP vendors' clients, we only interviewed SAP clients. The goal of these interviews was to understand why a company purchases an ERP (SAP) system, etc. (see chapter 2). We made this limitation due to our time-schedule. We thought that interviewing all ERP clients would be best, but we also believe that it is better to interview eight SAP clients than one client of each ERP vendor. An interview with only one (or two) client of an ERP vendor could lead to non-representative results.

2 Method

An analysis of the ERP market is a very broad task. We divided our study into three steps:

1. What is an ERP system, and what are its pros and cons?
 2. What does today's ERP market look like?
 3. What can we anticipate about the future ERP market?
1. In order to understand the ERP market we first had to learn more about ERP systems and their functionality. At our problem seminar on October 1 we realised that the concept ERP is not very well known to the public. Therefore we decided that describing the ERP system and its functionality had to be a large part of our final report. We carried out a pre-study with the aim to describe the ERP system. The written material available were books, articles on the Internet and brochures from the largest ERP vendors. Included in this pre-study was the comprehension of why companies buy ERP systems and the advantages and disadvantages of having an integrated ERP system in a company. An important part of collecting information about the ERP system was the interviews that we performed with the SAP clients. Our methods concerning the interviews are described in the next chapter.
 2. Since ERP is a relatively new concept we have not found any books written where the intention is to describe the ERP market of today. There are books describing the ERP system itself that also tell a little about the market, but mostly we have acquired information by reading recent reports, magazines and Internet articles. The most substantial part in our market study was the interviews with the largest ERP vendors in Sweden, a professor in standard application packages, Swedish experts in ERP systems, companies that have implemented an ERP system, and ERP consulting firms. This will be further discussed in chapter 2.2.
 3. The analysis of the future ERP market was carried out in the same manner as for the market of today.

2.1 Possible ways to obtain primary information

As the ERP market is new, there is not much documented about it, apart from Internet articles. Therefore we decided to use primary information. Since this information is the most crucial part of our investigation we believe that it is important to describe our approach. This part is to be found in Appendix A.

2.2 Our choice of method

We interviewed ERP vendors, SAP clients, ERP consulting firms, experts on ERP, and an ERP professor, using different types of methods.

When we interviewed SAP clients, companies that have implemented the SAP R/3 system, we had good knowledge of what we wanted to know. We had already read much literature concerning ERP systems, so these interviews were *planned interviews* where we had prepared approximately 50 questions. The main areas of these questions were: reasons for implementing an ERP system, choice of implementing partner, the

implementation process, the “going live” process, how the system works today, and the companies’ ERP needs in the future. The respondents were primarily IT directors, who also had the position of project leaders for their ERP implementation. The purpose of these interviews was to understand the whole process, from deciding to buy an ERP system to working with it today, from the client’s point of view.

In the other interviews, we used a mixture of *free interviews* and *planned interviews*. In the beginning of the interview we only asked the respondents to tell us about their opinion about the ERP market, and what they could anticipate about the future. After this we asked them questions in areas that they had not touched that we thought were important. We also had some follow-up questions concerning areas they had talked about.

During the interviews we used a tape recorder to eliminate the risks of missing important parts and to have the possibility to make quotations.

Before the interviews, the respondents were contacted by telephone and were informed about the purpose with these interviews. This first contact was to ensure that we had reached the right persons, who had the right knowledge and interest to take part in our investigation. We did not send over our questions before the interviews because we did not want the respondents to feel insecure if some questions concerned areas that they had little knowledge of.

We did not inform the respondents that this thesis is performed on behalf of CSC Sweden. The reasons for this were mainly two: firstly, it was an independent investigation where we felt no steering from CSC and, secondly, we did not want to influence the respondents by saying that the thesis is done on behalf of CSC Sweden. In those cases we informed the respondents they focused on the consulting business, but we were more interested in their general view of the market. If the respondent asked us if there was any company behind the survey, he/she was of course informed. The only respondents that we felt should know of our connection to CSC were the ERP consulting firms, since they are CSC’s competitors. We were pleased to discover that this was not a problem for the consulting firms.

2.2.1 Critical review of our method

One possible source of error is the interviews we made with the SAP clients, since we interviewed the persons that had been responsible for the SAP project. Since it was their choice of ERP system, it is likely that they are more positive than other users of the system. Some of the questions were also outside the project managers’ area, for example user acceptance of the system, and could therefore be somewhat erroneous.

3 Enterprise Resource Planning

Enterprise Resource Planning, ERP, is yet another of those three-letter acronyms. To describe an ERP system in a simple way one could say that ERP is an information system that manages all resources available in a company. It is a common term for a co-operating software that manages and co-ordinates much of a company's resources, assets and activities. Orders, storage, purchasing, assets, vendor contacts, financials, and human resources are usually included in an ERP system. We could illustrate the use of an ERP system by a simple example. When a store in Australia sells a product, data is sent simultaneously to the finance department in London and to the manufacturing department in Stockholm.

3.1 Information systems

In a company there are usually different types of information systems. These can be divided into three areas:

- Standard application packages
- Systems developed in-house
- "Joint-venture" systems

A "Joint-venture" system is a system that is a combination of a standard application package and an in-house-developed system. An in-house-developed system is a system that is customised to your own company. A standard application package system has been developed by a vendor to satisfy many users' (clients') business requirements. This means that users purchase a system on the market instead of developing a system on their own. An ERP system is a standard application package that is fully integrated. This means that the different systems, financial, manufacturing, etc., use the same database. This report will only consider the ERP system since the aim is to study the current and future ERP market.

3.2 The history of ERP

ERP's roots can be traced back to the ISVs, Independent Software Vendors, of the 1970s, who developed small-scale integrated financial and manufacturing packages, initially for minicomputers such as the IBM 3X range, Merrill (1998). In the 1980s, the concept was introduced to the mainframe market, but it still took some time before mainframe users started to take notice.

The standard application package is the opposite of the in-house developed information system, which has dominated the mainframe world. The cost of permanent employees, programmers and technical support to create and maintain the home-grown applications is one of the reasons for the dramatic fall of the in-house-developed applications. Equally important is the IT department's poor responsiveness to changes in business tactics, mergers/acquisitions, and economic cycle, according to Merrill (1998).

Combine this with other significant trends of the last decades open systems, such as the client/server revolution, downsizing, business process re-engineering, the Internet, globalisation and the accompanying need for common systems, and the buying power has shifted from technical to commercial departments.

The idea behind the standard applications packages is that several companies can use the same software. With several users, the costs of development, support and maintenance are shared. In addition, each client does not have to “reinvent the wheel”, Nilsson (1991).

The standard application packages are made for handling specific tasks. Financial systems are created for treating the financial information flow, and MPS systems for treating the logistic information flows in manufacturing. After these standard application packages came the ERP system, which also is a standard application package. The difference is that ERP is a system where the financial, manufacturing, distribution systems, etc., are integrated.

ERP is a concept developed by GartnerGroup. The term ERP has only been widely used for three or four years, but these systems and their predecessors, MRP (Material Requirements Planning) and MRP II (Manufacturing Resource Planning), have been actively sold for nearly 25 years. They are the primary business systems installed in tens of thousands of manufacturing companies around the world.

ERP vendors, as well as ERP “experts”, come from two major different origins: MRP systems and financial systems. The ERP vendors were vendors of one of the two systems above and became ERP vendors by building in the other part into the system. This is not that simple in reality, but broadly it can be seen this way. The company’s origin is often reflected in its system. If the vendor’s best module is its financial module, the company usually has an origin of being a vendor of financial systems. Today there are of course new vendors that started their business as ERP vendors.

3.3 The ERP system

The ERP system is an attempt to create an integrated product that manages all operations in a company. Before, the systems were not integrated and companies had (and many still have) several different systems for managing finance, storage, purchasing, etc., which were running separately. This caused large problems when trying to get the systems to work together. If you have many different systems you have to enter the same data into several systems. A couple of different “program islands” have been floating around in the companies and ERP is one attempt to link them into one unit. If you enter data into the module for manufacturing, the data is entered in the central database and obtained in the financial module simultaneously.

3.3.1 ERP – an example

It could be worth reading this example, Davenport (1998), to understand what the use of an ERP system can do for a company. It is an example of how an *ideal* ERP system could work. The functionality of the system depends on the extension of the acquired system, the number of modules, etc.

Let’s say that a Paris-based sales representative for a U.S. computer manufacturer, that uses an ERP system, prepares a quote for a client. The salesperson enters some basic information about the client’s requirements into his laptop computer, and the ERP system automatically produces a formal standard contract, in French, specifying the product’s configuration, price, and delivery date.

When the client accepts the quote, the system, after verifying the client's credit limit, records the order. The system schedules the shipment; identifies the best routing; and then, working backward from the delivery date, reserves the necessary materials from inventory; orders needed parts from suppliers; and schedules assembly in the company's factory in Taiwan. The sales and production forecasts are immediately updated, and a bill of materials is created. The sales representative's payroll account is credited with the correct commission, in French francs, and his travel account is credited with the expense of the call. The actual product cost and profitability are calculated, in U.S. dollars, and the divisional and corporate balance sheets, the accounts-payable and accounts-receivable ledgers, the cost-center accounts, and the corporate cash levels are all automatically updated. The system performs nearly every information transaction resulting from the sale.

3.3.2 The system's influence on a company

In order to understand the function of ERP systems you need to understand the problems they are designed to solve. Every big company collects, generates, and stores vast quantities of data. In most companies, however, the data are not kept in a single database. Instead, the information is spread across a large number of computer systems. Maintaining these different systems leads to large costs – for storing and rationalising redundant data as well as reformatting data from one system for use in another. But even more important than the direct costs are the indirect ones. If a company's sales and ordering systems cannot communicate with its production system then its manufacturing productivity and customer responsiveness will suffer. If its sales and marketing systems are incompatible with its financial systems then management is left to make important decisions based on instinct rather than according to a detailed understanding of product and customer profitability.

When developing systems in the past, companies would first decide how they wanted to do business and then choose a software package that would support their processes. They often rewrote large portions of the software code to ensure a tight fit. With ERP systems, however, the sequence is reversed. The business often has to be modified to fit the system. Some degree of customisation is possible. Since the systems are modular, companies are able to install only those modules that are most appropriate to their business. However, the complexity of the system makes major modifications impracticable.

As a result, most companies installing an ERP system need to adapt or completely even rework their processes to fit the requirements of the system. For some companies the ERP system can be the catalyst for reworking their processes but for others it might cause large problems.

Configuring an ERP system is largely a matter of compromises, of balancing the way you want to work with the way the system lets you work. ERP vendors try to structure the systems to reflect best practices, but it is the vendor, not the client, that is defining what "best" means. In many cases the system will enable a company to operate more efficiently than it did before. In some cases, however, the system's assumptions will run contrary to a company's best interests.

ERP systems may not be suitable for all companies. For a fast growing company with an organisation that is quickly changing, it may be difficult to benefit from an ERP

system. The problem is that the company has a different organisational structure when the system is implemented compared to when the project started, according to Philip Ekstrand, Data Webhouse. Some parts of the organisation may have been sold and new parts may have been acquired. Hence, the company will have to modify its ERP system again to make it suitable for the new organisation. When that job is finished, the organisation has changed again, and so on.

3.3.3 The structure of the ERP system

ERP systems consist of different modules. A company can therefore decide which modules they need and only acquire them, not needing to purchase them all. The ERP systems on the market today have the same main structure, which is shown in figure 3.3.3.

Traditionally a system must integrate three of the following core modules to belong to the ERP group: manufacturing, distribution, finance and human resources.

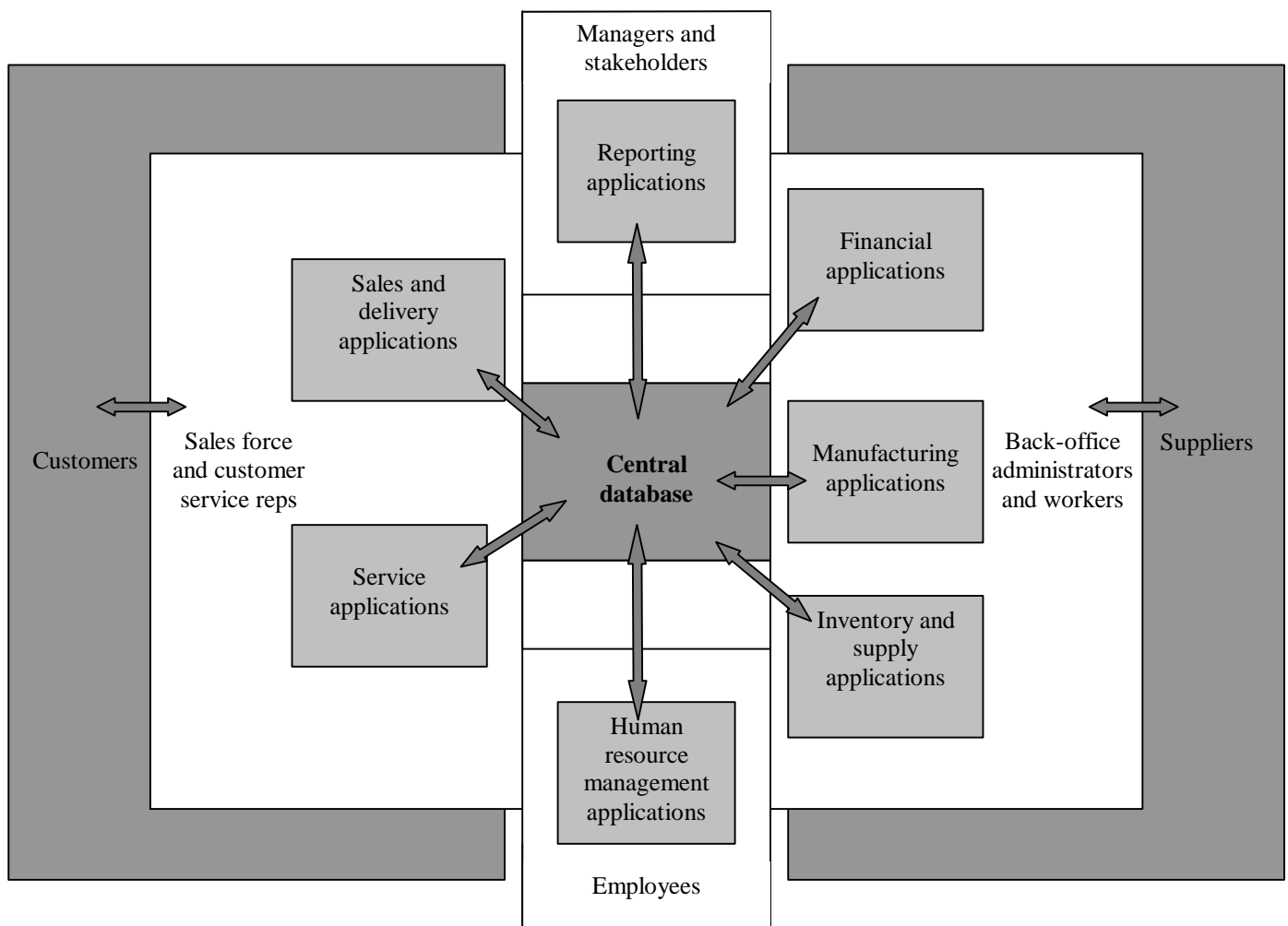


Figure 3.3.3: The ERP system, Davenport (1998).

At the heart of an ERP system is a central database that draws data from and feeds it into a series of applications supporting diverse company functions. Using a single database streamlines the flow of information throughout a business.

3.4 Why do companies acquire an ERP system?

Companies name the following advantages with having acquired an ERP system:

- The opportunity to see the whole company as one unit, since the system is integrated.
- The strategic possibility to rationalise and gain better control of the company's information flow.
- The old systems could not be developed, or it would be too expensive to develop them further, in order to support the company's processes.
- To reduce the maintenance cost of the information system environment by replacing several old systems with a single new one. This replacement also reduces the dependency on a few key users.

There are two major starting points for investing in an ERP system. Either the company sees it as a strategic solution, or it sees it as a technical solution.

“When it comes to IT the question is whether you want to computerise existing routines or if you want to develop the organisation with assistance from Information Technology?”, said Ulf Petrini, CEO Alfa Laval, from the book *Administrativa Standardsystem* (1995).

3.4.1 Strategic solution

A strategic solution means that a company acquires an ERP system because it is a part of its future strategies. For large enterprises it is very difficult to get a general overview of its organisation. This can be simplified with a uniform system where everybody works according to the same routines. This concerns especially today's more and more globalised companies. “ERP wakes up the dream of seeing the whole company as one unit”, says Bobby Cameron, analyst at Forrester Research. An integrated ERP system gives opportunities to rationalise and develop your organisation. An ERP system may be seen as a tool to obtain information that can be important when forming the company's future strategies. Information Technology to an increasing degree concerns the management, and the decision to buy an ERP system is almost always taken by the top management. The problem is that the management has little knowledge of ERP systems and has to rely on the IT department.

3.4.2 Technical solution

If the company sees ERP as a technical solution the main reason for changing systems is that its present information systems are too old. Two important factors have further caused this changing system process to boom, the year 2000 problem and the Euro, since the old systems cannot handle these new requirements. The Euro has not yet, however, been an important factor in Sweden.

3.4.2.1 Old systems

Some companies still use information systems developed in the seventies. These systems are in many cases developed in-house and are especially adapted for the company. Most of the companies have several systems developed by different vendors. The capacity of these systems is often not enough or they cannot be upgraded because they are not supported anymore. These are two major reasons for changing from old systems to externally developed ERP systems.

The decision to change system in this case is, according to our interviews, always taken by the IT director. Of course, he/she needs to have the management behind him/her, but the idea of changing system originates with the IT director.

3.4.2.2 Year 2000

No one has missed that Year 2000 is coming closer and what problems this causes. Many companies choose to replace their old software systems instead of making them Year 2000 compliant. Often, companies have a couple of separate systems for finance and logistics, etc., which makes upgrades difficult and time-consuming. In this mess with computers and programs it is very important to prioritise the most important functions that must be attended to before the millennium. The most important thing is to identify the systems that are crucial for the corporate activities, such as production planning and finance. Other supporting systems like market databases and word processing would not lead to a catastrophe for the company if the computers stop in the beginning of 2000.

Even if customised systems could guarantee compliance with Year 2000, which few IT Directors would put their necks on the line for, the time-scales are so exact and immovable that any ready-made option, like an ERP system, has to be seriously considered, Merrill (1998).

3.4.2.3 Euro

The largest single market in the western world has united under one common currency as of Jan 1, 1999. Some 300 million people in 11 member states of the European Union have adopted the Euro as their national currency. With the Euro comes a market demand for transparent and consistent pricing throughout that market, and a resulting change in business requirements that impacts both existing manufacturing systems and the underlying information technology systems. Any manufacturer based anywhere in the world that does business in Europe will be influenced by the Euro.

One reason for buying a new software system is that many of the old systems cannot handle the new currency, the Euro. But it is important to know that an ERP does not guarantee a solution to the problem. There is no standard way of dealing with the new currency; every European nation will handle the process in its own way and time. ERP solutions can at best claim to be 'Euro-ready'.

Besides the technical aspect, that the system needs to manage the Euro currency, there is also a strategic decision by the management to solve, see further chapter 5.14. There are many decisions that have to be made about how the company should use the new currency. This may delay the company's use of the new currency.

The Euro problem has been somewhat neglected because of the year 2000 uncertainty, which is considered a greater problem. Some analysts, like Professor Anders G. Nilsson at the Stockholm School of Economics, say that the Euro in fact is a more important problem than the millennium.

3.4.3 Technical and/or strategic solution - discussion

There are, as mentioned, two starting points when acquiring an ERP system. Either you see it as a technical solution or you see it as a strategic solution. However, it is impossible to separate them since they affect each other, as described by figure 3.4.3.

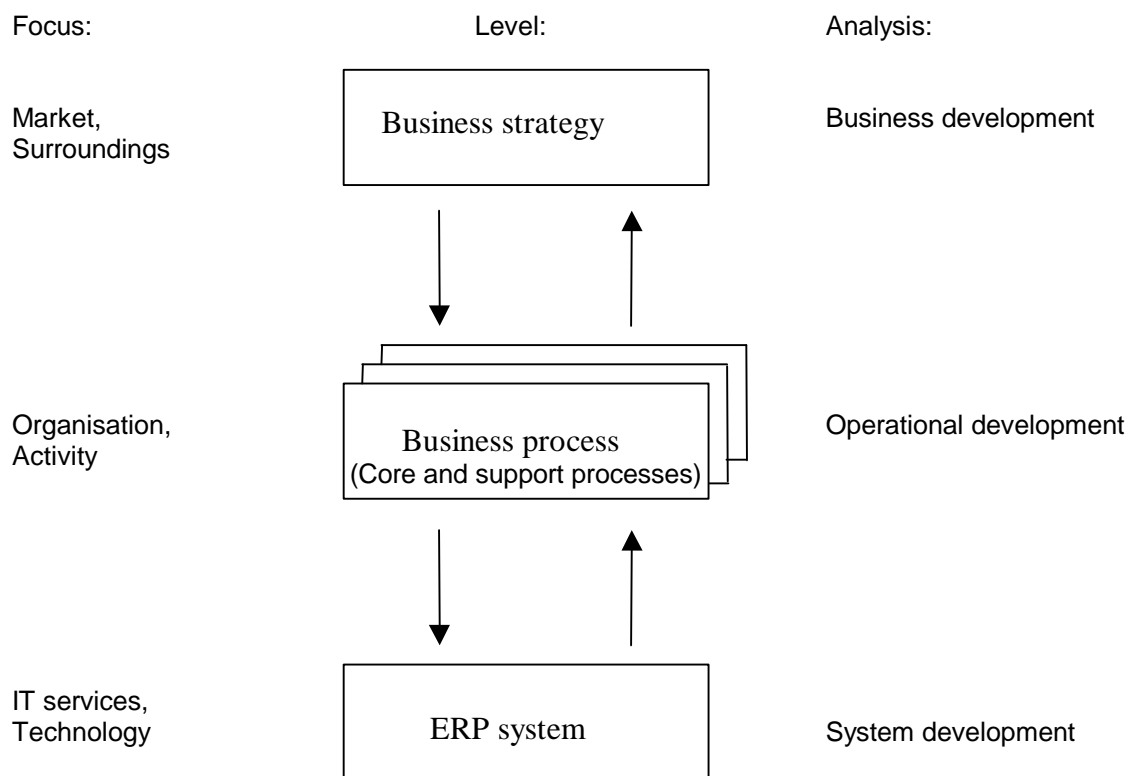


Figure 3.4.3: Level model for Change Management, Stymne, B et al (1999)

There are three levels affected when implementing an ERP system, Stymne B et al (1999):

- *Business development.* Development of the company's business strategies.
- *Operational development.* Development of the company's business processes and their relationship with concerned functions within the organisation.
- *System development.* Development and administration of necessary IT services, where the ERP system is an important part.

The top level touches the work with the company's business strategy. Business strategies indicate how we can strengthen the company's relations to different operators in the surroundings, for example clients, vendors, competitors and business partners.

The second level focuses on the development of internal operations in the company. Companies today analyse their business processes to find ways to become a more efficient company. Business processes define the workflow within the company's organisation.

The third level focuses on the company's need of IT services. The infrastructure of the company's activity consists of the use of IT. Appropriate IT is often a question for the company management, in order to estimate the technological level of the company. To acquire an ERP system should be, and is always, according to our interviews, a question for the top management. Unfortunately, the top management does not have enough knowledge of IT or ERP systems to be able to carry out the right decisions, so it has to rely on the IT director.

A problem for companies today is that the relationships between the different levels do not work satisfactory. The business processes are strongly connected to strategic management questions as well as to the ERP system. The second level is to be seen as the link between the strategic level and the system level. Practical experiences show that it is not possible to gain strategic effects from IT investments without modifying the company's business processes. This shows that we should never focus on one level at a time, which is often the case when implementing an ERP system. The large profits lie in working simultaneously on business strategy, business processes and the ERP system.

In the change management process you can choose whether you want to start with the business strategy, the business process or the ERP system. No matter where you start, the other areas are consequently affected. An ERP system, for example, sets restrictions for what can be accomplished in the processes and how strategies can be realised. On the other hand, an efficient business strategy gives guidelines for what should be prioritised in the business processes and the ERP system.

As mentioned earlier there are two major reasons for implementing an ERP system; some companies view it as a strategic solution and others as a technical solution. It depends on where the idea of implementing an ERP system first arises. It is important to have in mind, however, that both ways have direct effects on one another.

3.4.4 Interview evaluation

All of the companies that we interviewed saw their ERP acquisition from a technical point of view. In most cases the companies had old systems which they wanted to replace. About half of them had Year 2000 as an important factor for buying an ERP system. Not one of them even mentioned the new currency Euro as a major reason for changing software environment.

The reasons for changing system were mainly technical. The most important ones are listed here:

- To obtain a totally integrated system, which the ERP solution is.
- To achieve faster information flows.
- Capacity problem with the old system.
- Lack of maintenance for old systems.
- Replace several older systems with one new.
- To be able to develop the company's processes.
- Companies felt they were stuck in their old systems.

We also thought that it was interesting to know what kind of benefits the SAP clients expected to get with the new system. They were mainly the same as the ones mentioned above:

- An integrated system, where you avoid extra work. You only have to put data into the central ERP database instead of entering data first into the financial system and then into the MRP system, etc.
- Faster information flows.
- Easier maintenance. Since the ERP system replaces as many as 300 old systems, it is easier to maintain.
- Decreased inventory times.

3.5.2 Negative effects

- *External vendor without company knowledge.* To acquire an ERP system means buying a system that is not specifically adapted to the company. But systems adapted to specific industries are coming and will be improved in the years ahead.
- *Increased need of external competence.* Since the market has grown so quickly, there is a lack of skilled people. It is difficult to keep the internal competence and you therefore need much help from consulting firms.
- *New routines for the staff.* An ERP system is hard to adapt completely to the organisation. This means new routines for the staff, which make the work more difficult in a period of transition.
- *Freezes system development to the vendor.* The company follows the vendor's development with little possibility to influence. The programs can be hard to support for the company itself. The client will also have to purchase future releases of the system.
- *Underestimates the importance of the pre-study.* The company may after the implementation have a system that it cannot handle.

3.6 Implementing an ERP system

Concisely one can say that the implementation of an ERP system means the procedure from buying the system, the software, to the “going live” sequence when the system is put into operation.

There are several reasons for treating this chapter. One is that the implementation costs are greater than the software itself for most of the ERP systems. There are differing opinions about the relationship between these two factors and it varies between different systems, but to give you an idea the relationship ranges from 1:1 up to 1:10 for bad implementations. Normally the relationship is between 1:2 and 1:3. A second reason is that the implementation process is an important competitive factor, both for the consulting firms that run the implementation and the ERP vendors.

According to a research among 446 Nordic companies made by Market-Visio (1998), the average pay-back time for an ERP system is 38 months.

There is much written about the cost of hiring consultants. The ERP clients that we have interviewed have mentioned the following project cost portion: hardware 20 percent, software 20 percent and consultants 60 percent. The Market-Visio report shows the following figures for 446 Nordic clients:

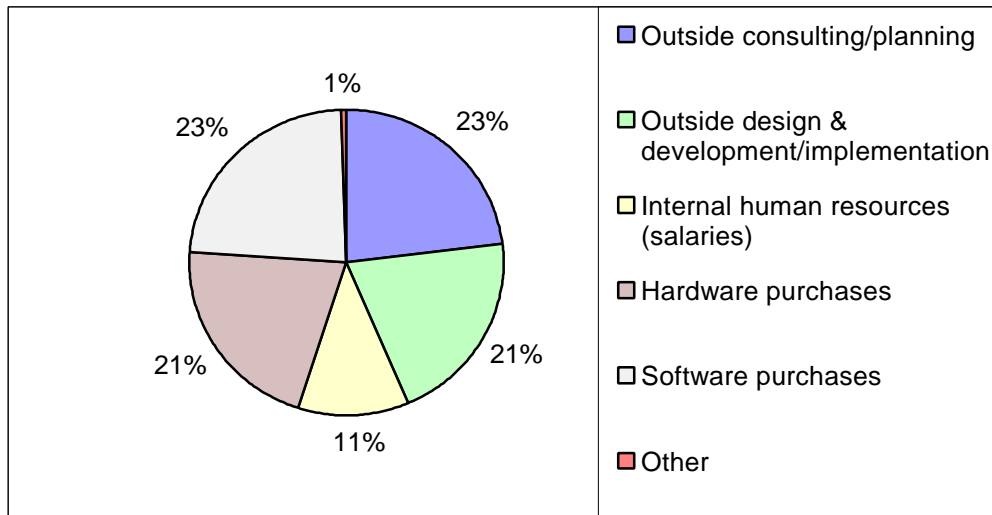


Figure 3.6.1: Project cost portion, Market-Visio (1998)

According to the same report, the budgets for the ERP projects were:

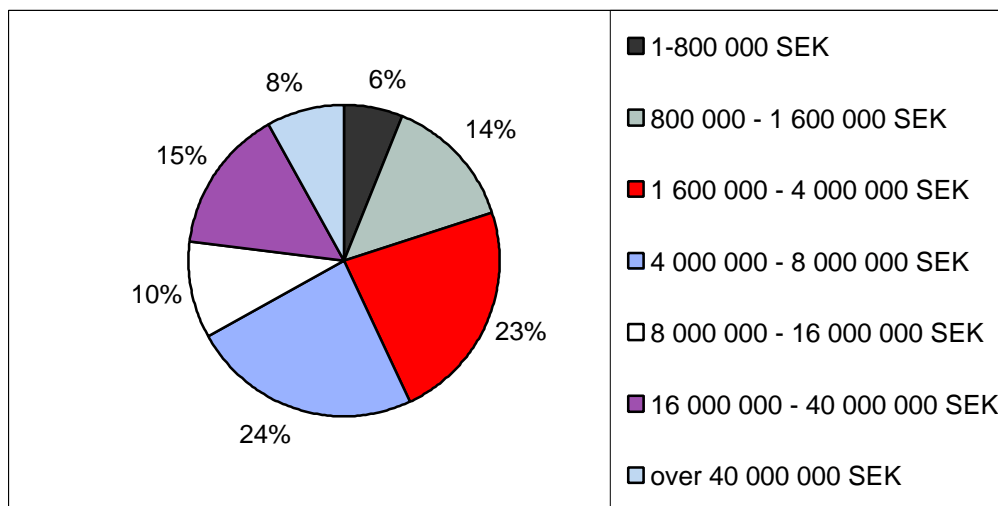


Figure 3.6.2: Budgets of ERP projects, Market-Visio (1998)

The most expensive projects were SAP R/3 projects. Out of all the SAP R/3 projects, 35 percent were in the category of above 16 million Swedish SEK. The most inexpensive ERP projects were found among IFS, Aspect and Prosit projects, Market-Visio (1998). One must keep in mind that SAP's clients are primarily large international companies and those projects are therefore naturally more expensive.

There are two major alignments on the implementation market. Some ERP vendors are both system developers and run the implementation process themselves. Others have different business partners where the partner is responsible for the implementation and the ERP vendor only sells the system. Between these two alignments there are cases where the vendor runs some implementations and lets partners run others.

3.6.1 The implementation process

The implementation process is as mentioned earlier an important part of acquiring an ERP system. If the process is not handled right it will cost much money and in the worst case the implementation will not work out at all, so the company will have spent money on a product that does no good.

Those services that are indirectly related to an implementation of an ERP system are the following according to Andersson & Nilsson (1996):

- *Procurement.* Comprise inquiries on client's needs and goals.
- *Project management.* The clients often do not have the resources to carry out the necessary activities for a successful implementation. In some cases they therefore need someone to take total responsibility for the implementation and the related services. However, according to our interviews with ERP clients, the best implementation processes have been those where the client itself is highly involved in the management of the project.
- *Routine consultants help.* Comprises help in changing routines when implementing an ERP system and transferring of information from previous systems.
- *The implementation process:* Provides the client's physical installation of the system and modifications and adjustments for the client's requirements.
- *Training.* Has the aim to give the client knowledge in how the system could best be used. Training should occur when implementing the system, when buying new releases, when changing staff, and when the client buy new modules. According to our interviews, the user training should occur as close to the going live point as possible.
- *Support.* Involves assistance when errors occur, which are caused by bad handling or product failure. Some ERP vendors have support systems, which their clients can connect themselves to.
- *Service and new releases.* The vendors offer contracts, which give the client a possibility to, on pre-set conditions, upgrade their systems to new releases. Some vendors also have agreements concerning service.

As mentioned earlier the implementation time, as well as the implementation cost, is a problem for the ERP vendors. Many systems can take years to implement, and cost much more money than first expected. Recently an American company sued an ERP vendor as well as the consulting firm for 500 million dollars each. The company went bankrupt in 1996 and, according to its lawyers, the ERP system was an essential reason for the company's financial problems. According to the company the ERP solution never worked out, and the reason for the company going to court is that it claims that the ERP vendor and the consulting firm did nothing to correct the errors. The court has not made any decision yet.

SAP, as well as the other ERP vendors, has worked hard on reducing the implementation time; one example is their implementation method AcceleratedSAP.

3.6.2 Implementation success factors

Benchmarking Partners Inc. has examined 150 ERP implementations and highlighted five factors that contribute to a project's success:

- 88 percent of the interview subjects cited the need for appropriate resources that are dedicated full-time.
- 43 percent reported the need for significant amount of time for and content of training.
- 42 percent highlighted the need to manage the change and to have an appropriate level of senior management involvement.
- 31 percent cited the need for the right level of business process re-engineering throughout the project.

- 30 percent reported the need for clear selection criteria, well-defined roles and strategies for effective knowledge transfer.

Another very important success factor is the client's commitment to and understanding of the ERP project, according to our interviews.

3.7 The consulting business concerning ERP systems

Some ERP vendors only devote themselves to selling their system. The implementation is instead run by a consulting firm, which is related to the vendor in some form of partnership. Others sell the system and do the implementation as well.

Figure 3.7 shows an example of the relationship between an ERP vendor, an ERP consulting firm, and an ERP client, when a consulting firm runs the implementation. In this example the client purchases the ERP system from SAP, and then purchases the implementation services from in this case CSC.

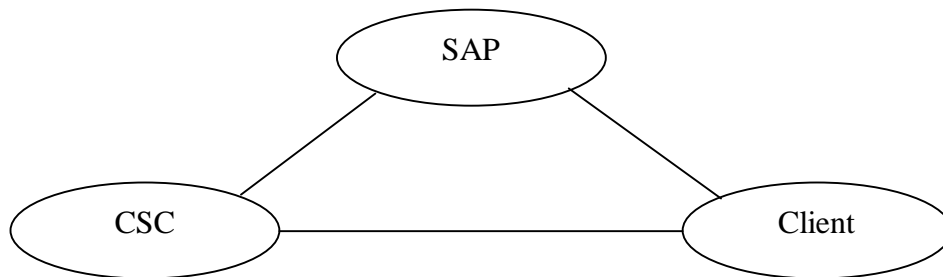


Figure 3.7: The relationship between ERP vendor, consulting firm and client

We have found some different opinions on the issue of whether the software vendor should do the implementation. Here are some of the pros and cons for the ERP vendors of doing implementation themselves:

Positive effects

- The consultants are closer to the developers, which makes it easier to get in-depth information about the system.
- The vendors get faster feedback from the implementations and are able to make corrections if necessary.
- The vendor only has to develop and work with one method to make the implementation, unless the client prefers to work with his own method.
- You are able to have better control of the implementation process work. If the third-party vendor does not do a good job it is likely that the client also will blame the system.

Negative effects

- It takes focus from the vendor's core area of developing software, since it has to build up its own consulting service. It is costly to expand in the consulting area, which takes money from the developers and in the end leads to a less functional product.
- It is difficult to attract large global clients if you cannot provide implementation service in all the countries where the client is represented.
- If you work with partners you get an additional way to distribute your products. They make money implementing the system and are actively searching for clients.

- When you implement an ERP system it is not only installed to replace an old system and work like the old one. One of the main things about getting an ERP system is that you are able to reorganise and develop new ways to do things. Here, the big consulting firms have an advantage, since they have been working with these kinds of questions for a long time.
- Some of the people we have talked to say that it is difficult for the ERP vendor to make money on the implementation. Since he has the total responsibility for both the system and implementation, he often makes things for “free”. If there is a system problem, the consultants will have to fix it without being able to charge the client for the extra time.

CSC is a consulting firm, which sells services relating to ERP implementations. On a global basis, CSC is a partner with four of the world’s five largest ERP vendors: Baan, Oracle Applications, Peoplesoft and SAP. Other consulting firms are the “big five”: Andersen Consulting, Deloitte & Touche, Ernst & Young, KPMG and PriceWaterhouseCoopers.

3.7.1 Important factors when choosing an ERP consulting partner

Since consulting is needed to implement an ERP system, the companies have to evaluate a consulting partner. The important factors when choosing a consulting firm, according to our interviews, were the following:

- Reference projects.
- Qualified consultants with documented experience of previous ERP projects.
- The consulting firm’s working culture.
- The ability to dedicate appropriate resources full-time throughout the project.
- Knowledge of relevant modules.

An interesting fact is that only one company mentioned the price of consultants as an important factor. Some companies have used several consulting partners during the implementation project. One company received the following recommendation from SAP: “Hire only consultants with at least one year of experience of the SAP R/3-system”. The problem was that R/3 was only seven months old.

4 The ERP market

4.1 Introduction

The ERP market has grown quickly the last few years, both in Sweden and globally. The world revenue growth rate for 1997 was over 60 percent for the ten largest ERP vendors. The main reasons for this enormous growth can in particular be attributed to the inability of older systems to manage the conversion to Year 2000 and the introduction of the Euro and therefore needed to be replaced. The Euro has mostly affected the growth in the EMU countries. None of the Swedish clients that we have interviewed had acquired a new system because of the new European currency. During 1998, the market has continued to grow very fast. The ERP vendors, however, have shown a smaller growth for 1998, especially for the fourth quarter. We will discuss this market trend further in chapter 5.2.

Another factor behind the growth is that already existing clients acquire more licenses and modules. The number of employees using the ERP system is increasing and the ERP clients that have started with the basic modules will purchase subsequent applications. There is also a trend to replace customised systems with standard application packages, like an ERP system.

The ERP market is concentrated to the western countries, where 88 percent of the market is located, according to GartnerGroup. Therefore, there is a great potential in other parts of the world in the coming years.

It is almost impossible to define the size of the ERP market. All analysts have their own definition and therefore their own version concerning dominating companies, market shares, present size of the market and future market growth. AMR, Advanced Manufacturing Research, estimates that the world market for ERP systems had a turnover for 1998 of ten billion US dollars. IDC, another analytical firm, estimates that the market was worth 14,4 billion dollars in 1997, and would grow by 20 percent per year. A recent study from IDC's European Software Expertise Center indicates that ERP software now accounts for more than half of the software licenses and maintenance revenues in western Europe, growing twice as fast as the rate of the overall application market.

One of the largest problems on the market today is the lack of competent people. It is difficult for companies to employ people with ERP experience. ERP clients are most affected by this problem. Their employees that work with the system become so called "super users" and are very attractive on the job market. The consulting firms can offer them better conditions and salaries, which makes it difficult for clients to keep their employees.

4.2 Standard applications or customised solutions

To look at the ERP market from another point of view is to see how large it is compared to the market for customised information systems. The survey Market-Visio (1998), examined the amount of standard applications and customised applications among 446 of the largest companies in the Nordic countries aiming to procure ERP systems. At present, over half of the applications are mainly customised, see figure 4.2.

In Sweden the amount of customised systems is as high as 70 percent. Within two years the standard applications will increase to over 60 percent.

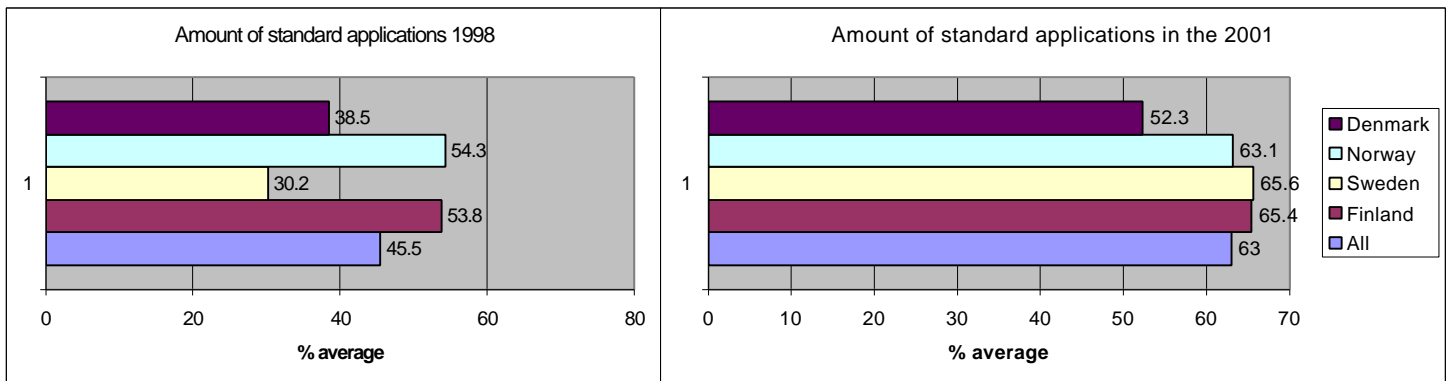


Figure 4.2: The proportions of standard application software, Market-Visio (1998)

The investigation is made among large clients. They are ahead of the middle-sized and small clients, where the amount of standard applications and ERP systems is smaller. Mainly the large companies are changing from customised to standard applications today, but smaller companies will probably follow this trend later on.

4.3 ERP vendors

When it comes to ERP vendors, one company is dominating the world market totally: SAP. The others have more or less given up the first place and are fighting for the second one. The German vendor SAP occupies approximately 30 percent of the world market. In the table below, the eight largest ERP vendors in 1998 are listed. The sales figures are the companies' sales concerning their ERP business.

Company	Product	Sales M SEK 1998	Net profit 1998	Growth % 1998	Growth % 1997
SAP	R/3	40 400	5 000	41	58
Oracle	Oracle Applications	16 800	-	42	83
Peoplesoft	Peoplesoft	10 500	1 150	69	108
JD Edwards	One World	7 500	600	52	57
Baan	Baan IV	6 000	-250	15	100
SSA	BPCS	3 400	-165	2	43
JBA	Business 400	2 800*	-	-	58
Intentia	Movex	2 500	24	52	50

Figure 4.3: The eight largest ERP vendors in the world 1998 (*: revenue for 1997, -:no figures presented yet)

Most people that we have talked to agree that, to be able to compete on the future ERP market you have to be in the top ten. This is because of the cost of developing these systems, it is volume that settles profitability.

The Swedish ERP market is very different compared to others. Among the world's fifteen largest ERP vendors, three are Swedish: IBS, IFS and Intentia, of which Intentia is largest with revenue of 2,5 billion SEK for 1998. These three companies are dominating the Swedish market with a market share of nearly 50 percent. It is difficult to define the market shares in Sweden. We have only found one study, which was

carried out by Dataquest, an analysis firm owned by GartnerGroup, which is shown in figure 4.3.2 below.

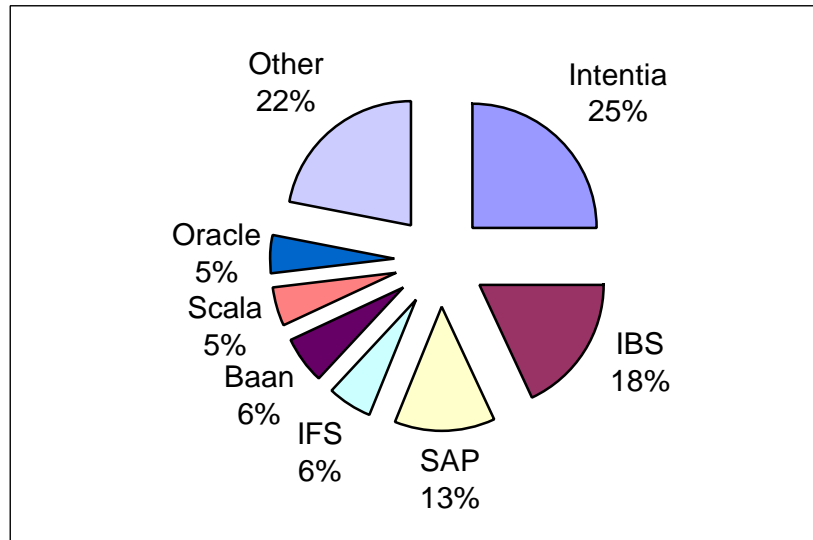


Figure 4.3.2: Shares of ERP license fees in Sweden 1997, Dataquest

We have shown this figure to the ERP vendors that we have visited and some are positive and others negative to these market share values. It is difficult to compare the companies' market shares in Sweden. One reason is that some of the companies, as we have described earlier, run the ERP consulting business by themselves, while others have partners. That is the reason why we cannot compare the companies' revenues in Sweden. Another reason is the problem of defining the license fees. Should only new sales or should things like support and supplementary sale be included in the license fees? The vendors do not include the same things in their annual reports figures, which leads to dilemmas when comparing their market shares. Some companies do only show figures of Nordic license fees and revenues, which is another factor that causes problems.

4.4 The market positions of the ERP vendors

In the book Marketing Management, Kotler refers to the Arthur D. Little consulting firm, where he argues that a firm will occupy one of the following six competitive positions on the market.

- *Dominant.* This firm controls the behaviour of other competitors and has a wide choice of strategic options.
- *Strong.* This firm can take independent action without endangering its long-term position and can maintain its long-term position regardless of competitors' actions.
- *Favourable.* This firm has an exploitable strength and a better-than-average opportunity to improve its position.
- *Tenable.* This firm is performing at a sufficiently satisfactory level to warrant continuing in business, but it exists at the sufferance of the dominant company and has a less-than-average opportunity to improve its position.
- *Weak.* This firm has unsatisfactory performance and an opportunity exists for improvement. The firm must change or else exit.
- *Nonviable.* This firm has unsatisfactory performance and no opportunity for improvement.

We have used this method in an attempt to describe each company's position on the market.

4.4.1 Global market

There is only one *dominant* player on the market, SAP. In the second group it is difficult to find any competitors on the ERP market. This is because the gap to SAP, in terms of revenue, is too large. On the other hand, there are plenty of competitive companies in the third group. The other vendors that we have investigated are, as we see it, in the category *favourable* or *tenable*. Even among ERP vendors that we have not investigated thoroughly, it is difficult to find *weak* and *nonviable* companies. The reason is probably the booming market. Since the market has grown so quickly there has been room for many competitors to grow.

4.4.1.1 SAP

The world's leading vendor of ERP systems is the German company SAP AG. The functions for handling multiple companies and currencies are advanced and that is why many global companies choose R/3. R/3 is the follower to the system R/2 and was introduced in 1992. The system operates on the platforms Unix, NT and OS/400 and can use most of the established databases. SAP's clients are mainly big international companies with revenue of at least 300 million SEK. The system SAP has more than 7500 clients in over 90 countries. In 1998 the company had revenue of 40,4 billion SEK. SAP has had representation in Sweden since 1988 with revenue of 306 million SEK in 1997. The system R/3 is written in the language ABAP/4 and is built in 12 different modules.

SAP was first to enter the market and thereby gained early market shares, which is probably the most important reason for their success. Their early sales of R/2 and R/3 generated high profit margins and client loyalty, establishing SAP as the definitive ERP vendor. In terms of revenue, profit, earnings per share, research and development spending, and market share, SAP is far ahead of its competitors. It will, however, be difficult for SAP to continue its growth figures from the last years. SAP's preliminary figures indicate that revenue for 1998 grew close to 41 percent, a slight slow-down compared to 1997. But according to the Xephon focus report there is a downside. Release 4.0 is even more complex than the last version of R/3, so users will ask if it is worth upgrading now.

One problem for SAP is that the growth of the market for large companies, SAP's primary clients, tends to slow down. Most of the large firms that need an ERP-system have already implemented one. SAP expects to sell plenty more R/3 modules to its existing clients, but growth will be led by converting the smaller organisations. Some analysts say that SAP R/3 is too big and complex for smaller clients. SAP must develop smaller and cheaper systems for this group. Other analysts, referring to the Xephon focus report, say that SAP will have no problem gaining new reference sites. Many smaller organisations are subsidiaries of multinationals, some of which have already implemented SAP solutions, so there will be plenty of early sales to help build the client base. It can also be worth pointing out that R/3 was originally designed for the middle-market, according to the Xephon report. SAP's commitment to product development is unrivalled. In 1997, it dedicated 14% of revenue, almost \$500 million, to R&D, which is more than the total revenue of most of its competitors.

The most significant problem with the R/3 system is its implementation complexity. According to the other top five vendors, the “typical” SAP implementation takes somewhere between eighteen months and five years. However, SAP does not make money on long implementation time, since their partners perform the implementation of SAP R/3. Therefore, they make large efforts in reducing the implementation time.

4.4.1.2 Oracle

SAP’s nearest challenger, in terms of revenue, is Oracle with its product Oracle Applications. Oracle established itself as the largest database vendor before moving into the ERP market in 1989. Its applications were developed without the constraints of legacy systems and were among the first to use the advanced capabilities of relational database design. Oracle Applications had revenue of 16,8 billion SEK in 1998.

Brand name is a success factor for Oracle who is the second largest software company in the world, only beaten by Microsoft. Unfortunately, it is impossible to give figures of the success to date of Oracle Applications. The company is not obliged to produce separate accounts for the ERP part of its business. Therefore figures like profitability, R&D expenditure and other financial indices are not available.

One reason for Oracle not being so successful is that the firm has prioritised marketing rather than functionality or value for money according to the Xephon report. Larry Ellison, CEO of Oracle, is since last autumn in charge for Oracle Applications, which is one indication that Oracle believes that ERP is important for the future. But even with a power of the second largest software company, it is hard to see that Oracle Applications could compete with SAP as the dominant ERP vendor.

4.4.1.3 Peoplesoft

The third largest ERP vendor is Peoplesoft. The California-based company is the youngest of the five largest ERP vendors, founded in 1987. In 1998, the company had revenue of 10,5 billion SEK. Peoplesoft’s roots are in the area of Human Resources, which is still the company’s strength. Some critics consider that Peoplesoft is not a complete ERP vendor, but the company has today well-developed modules in manufacturing, distribution and financials.

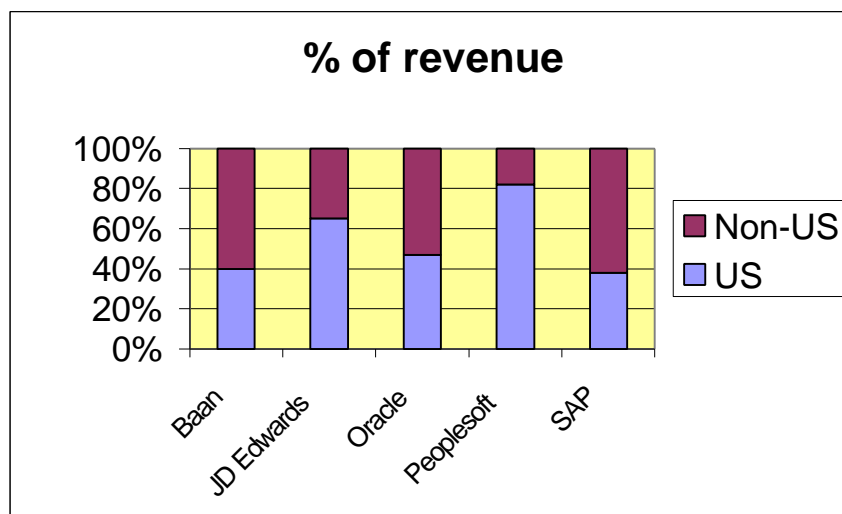


Figure 4.4.1.3: The vendors US revenue compared to its total revenue in 1997, Merrill (1998)

Peoplesoft's competitors often say that it is too US-centric to make a serious challenge to the market. Only 20 percent of its sales are derived from clients outside USA, which is a very small amount compared to its competitors, see figure 4.4.1.3.

The US accounts for around 25 percent of world GDP, so a vendor should therefore be aiming to derive 75 percent of its revenue from other parts of the world in order to make the most of world-wide business potential. Here, Baan and SAP have a head start over US vendors. There is, however, evidence of progress. Last year, European contract signings and service revenue grew by approximately 130 percent, but it is worth pointing out that this was from a fairly low base. Peoplesoft is also targeting the middle-market with Peoplesoft Select, a packaged solution that simplifies the implementation process. Whereas R/3 originated from a manufacturing-based solution and Oracle Applications is technologically advanced, Peoplesoft 7.5 is oriented on people.

4.4.1.4 JD Edwards

US-based JD Edwards (JDE) was founded 1977 and is the fifth largest ERP-vendor today. JDE started as a custom software developer, then moved to off-the-shelf (finance and logistics) packages. The company continued to expand into new markets with the addition of manufacturing modules. JDE mostly targets mid-size corporations and has enjoyed a long-term growth rate in excess of 50% over its 20 years in business and its revenue reached 7,5 billion SEK in 1998.

At a JD Edwards user conference in the summer of 1998, CEO Ed McVaney said that, "If we don't grow faster than Peoplesoft and SAP, we won't be around in five years". These words may have been intended to be self-motivating, but they show what a battle for market shares there is on the ERP market. The only intention of many ERP vendors is to gain market shares and they do not at all prioritise profit, which can be read in their annual reports.

In 1998, 59 percent of JD Edwards' revenue originated from services, which encompasses anything other than license fees, such as training and consulting. The company will probably have to get closer to the industry norm of 2:1, in favour of licence fees, if it is to stay as one of successful ERP vendors in the future, according to Merrill (1998). After three years of development its products are now sold under the brand name OneWorld. JD Edwards has divided its market into AS/400 and other platforms, in particular Unix and NT. Between now and the millennium, JD Edwards expects to grow more quickly than the ERP market by developing its presence in non-AS/400 segments. It also believes that electronic commerce will further boost sales of OneWorld. Web trading can easily be integrated into JD Edwards' product set, which, according to the company, has been developed during the Web's period of explosive growth unlike others.

Client satisfaction is a determinant of JD Edwards' success. Market research has found that 90 percent of its clients would recommend the company's solutions to reference-hunting prospects. This compares with an industry average of around 65 percent, according to Merrill (1998). Many of JD Edwards' clients, and many clients of other ERP vendors, have only purchased one component of the complete portfolio – typically accounting – so there are good opportunities to sell more components.

4.4.1.5 Baan

The Dutch company Baan was founded in 1978 as a provider of financial and administrative consulting services. It commenced shipment of its first information system in 1982. It remained a medium-sized European company until 1995 when they signed a large deal with Boeing, which boosted Baan's revenue and helped the company establish itself as one of the five largest ERP vendors. Baan's strategy concentrates on manufacturing and logistic systems and operates on Unix and NT. Today, Baan has implemented its system Baan 4 in more than 2800 companies. Its revenue in 1998 was 6,0 billion SEK.

To minimise time to market, Baan has acquired several software companies, with corporate financials specialist Coda the most notable of fifteen acquisitions in eighteen months. Other niche products for budgeting, client engineering, and asset management have also been bought. Acquisition certainly reduces time to market, but it also necessitates the development of interfaces with Baan IV and integration. Baan's acquisitions have been costly and Baan showed a weak result for the third and fourth quarter of 1998. Baan also had to lay off 1200 employees, which is highly unusual in a market that grows as fast as the ERP market.

Baan maintains that, although the componentisation, see chapter 5.6, of its products is a lengthy process, it is considerably less difficult than the task faced by SAP. Products such as R/3 have been sold on the strength of their modules' unity. This is fine for clients who needed an off-the-shelf solution for a downsized environment in the 1990s, says Baan.

With fifteen externally developed products to be integrated with the homegrown core, Baan is more exposed than most to unforeseen problems. Nevertheless, the company believes the brand names and client lists that came with the acquisitions outweigh the problems.

4.4.1.6 Intenia

Intenia is Sweden's largest ERP vendor and the eighth largest in the world. Intenia was founded in 1984 and has during the last five years grown 44 percent annually and reached revenue of 2,5 billion SEK in 1998. Intenia had at the end of the year 1998 approximately 2850 employees. The system Intenia has developed is called Movex and operates on IBM's minicomputer AS/400. Intenia has its major clients among middle-sized manufacturing companies.

Intenia's goal is to become one of the five largest ERP vendors in the world in the near future. It believes that this is necessary to survive. Therefore, Intenia prioritise growth before profit, and will continue to do so. When it has reached the critical size, it will start prioritising profits. Intenia's management hopes this will be possible by year 2002.

In November, Intenia presented its new Java-based solution. This means that it will be possible to run Movex on all platforms. Intenia has unveiled the world's first ERP software entirely based on Java. According to GartnerGroup, Java will become the most popular language and platform technology for network computing applications through year 2002. Gartner also estimates that more than 60 percent of organisations will use Java in corporate enterprise environments by 2001.

4.4.1.7 IBS

Sweden-based IBS, International Business Systems, is the vendor of the system ASW. The company was founded in 1969 and had revenue of 2,1 billion SEK in 1998. It had a 59 percent revenue increase for 1998. IBS does, as opposed to Intenia and IFS, prioritise to show profit figures. IBS exists only for the platform AS/400. ASW's best functions are purchasing, order, storage and financials. IBS has its major clients among middle-sized distribution companies.

IBS sets much hope to the San Francisco project, which it is developing together with IBM. IBS is the leading supplier in the San Francisco project, which is set to transform the way software is developed in the future. The basic idea is to develop an object oriented, flexible hardware independent business application platform using the Java programming language. This platform will be a common starting point for many different software providers, developing different applications, to extend to full-scale commercial business applications. San Francisco also provides the capability to make new Java components that can be reused. The software will be able to run on all major computers like NT servers, AS/400 and Unix-based systems.

The objectives of the project are to speed up the time it takes to develop software applications and to make them more flexible, in order to respond to rapidly changing business requirements. A joint development team from IBM and IBS has been working on the project since early 1996 at laboratories in Germany and the U.S.

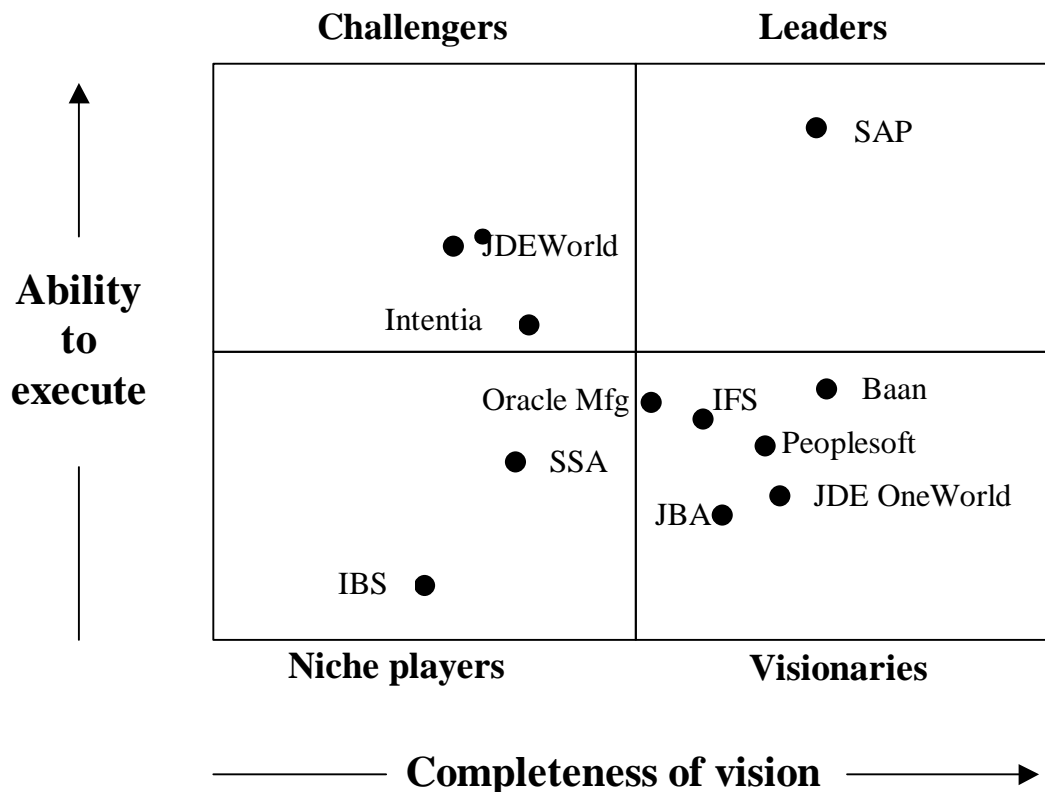
4.4.1.8 IFS

The Swedish company IFS, Industrial Financial Systems, and its product IFS Applications is one of the world's fastest growing ERP vendors and had revenue of 632 million SEK 1997. From October 1997 to September 1998, IFS shows a revenue growth of 104 percent to 1,0 billion SEK. IFS was founded in 1983. The system is mainly for large and medium sized manufacturing companies. The product's best functions are materials and production planning, salaries and maintenance. Oracle is their only database and the system is adapted for Unix and Windows NT.

The IFS management believes as Intenia and IBS, that much of its future success depends on how it will succeed on the US market. One major disadvantage for the Swedish ERP vendors are that their home market is too small, compared to, for example, its US competitors.

4.4.2 ERP vendor ranking

The analyst firm GartnerGroup has made an analysis of the ERP vendors and their market positions. The GartnerGroup ranking of ERP vendors is shown in figure 4.4.2.



Figur 4.4.2: GartnerGroup ranking of ERP vendors, December 1998

GartnerGroup believes that SAP will gain even larger market shares, up to 60 percent.

4.4.3 The Swedish market

The Swedish ERP market is different from other markets because of the dominance of local ERP vendors like Intenia, IBS and IFS. The Swedish market is said to be tougher than other markets. The market is not very large and there are many competitors. Swedish companies are also more familiar with the use of IT compared to many other countries. Baan, for example, made an investigation showing that Swedish companies could on average name ten ERP vendors, compared to the rest of the world, where they on average could only enumerate two.

Among the eleven largest software companies in Sweden, seven are ERP vendors, according to Affärsvärlden (June 97).

Intenia and IBS have dominated the Swedish ERP market. The third largest Swedish vendor IFS has grown quickly by around 100 percent per year recently and is catching up the other two. The international ERP vendors are entering the Swedish market and are gaining market shares, as well, especially among the largest companies. SAP has come further in its penetration of the Swedish market than the others have. Baan and Oracle are established in Sweden and JD Edwards are about to start its own unit in Stockholm. Peoplesoft has no office in Sweden.

Since the Swedish and the other Nordic countries' markets are relatively small they are usually considered as one Nordic market, especially from the international companies' point of view. The vendors we have interviewed, for example, always talked about the Nordic or Scandinavian market instead of the Swedish. The Swedish market is never considered individually in market reports.

One can wonder why international ERP vendors want to enter a small market like Sweden. One reason is that Sweden has many large and international companies represented world-wide. Consequently many important and relatively large deals can be found in Sweden. One global ERP consulting firm has recently signed its largest current deal with a Swedish client. Sweden is also a mature IT market, with companies that have a modern IT structure. This is interesting for ERP vendors because they receive an early response to their new products in Sweden.

4.5 The product life cycle

A good way of describing the ERP vendors market position is to look at their products' life cycles. This can also be worth considering when buying an ERP system. Sören Janstål, Data Research DPU, has developed the product life cycle with the help of a modified Boston matrix, see Figure 4.5.1. Data Research DPU helps large and middle-sized organisations to evaluate and select software and hardware, where ERP is one of its businesses.

A new product starts as a Baby and continues its way through the category Star, and when the product is mature it is to be found among the Cash cows. When its technology gets old the product loses clients and ends up in the category Doggie. The product follows the following circle, starting from the baby stage:

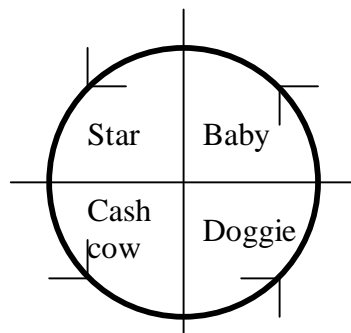


Figure 4.5: The product life cycle, DPU

A system in the Baby stage has not fully reached the market. Some products fail already here, because of lack of financial resources to be able to market the product. But the product will in most cases survive, often overtaken by a stronger competitor. In the next stage, Star, the product has been developed strongly and the number of clients is growing quickly. There is a risk in this stage to lose balance between sales income and costs for research and development.

When the product becomes a Cash cow, the functionality is high, the market share is large and the company receives large profits from the product. A problem is that the systems get increasingly complex, which makes them even more expensive to develop. This causes major problems for smaller vendors. The last and worst stage, the Doggie, includes unpleasant clients, low profit and expensive development costs.

“A well-performed business application package can be sold and maintained at most in 15-20 years. In late stages the package has old architecture and contains of "spaghetti code". It is hard to make changes in the program code without hazardous damage of the systems stability. It is, for instance, easier to make new systems year 2000 and EMU proof than in older packages”, says Sören Janstål, DPU. It is possible to give older

systems a "face lift" with modern tools, e.g. with Microsoft Windows interface. Those "face-lifts" can extend the life cycle for the package some years. But they will certainly speed up the appearance of "spaghetti code".

The ideal is to find mature Stars in selection of packages. Stars are often subject to development, the vendor makes lots of profit, the remaining life time for the package is satisfactory long and most of the bugs are gone.

The appearance of new system design and technology often means that new things can be done that give users many advantages. There is no easy way to include new technology in older systems. Compromises and "spaghetti code" are often the result in those cases.

Sören Janstål has in the figure below placed the most common standard software products in the Boston Matrix. It is important to point out that the axes are not graded. The best way to understand the figure is to look at how far from an axis a product can be found. If it is close to an axis, it means that it will soon continue to the next quadrant. An explanation of the different stages can be found in figure 4.5.2. The products marked in bold are the products that we have looked upon.

Boston Matrix

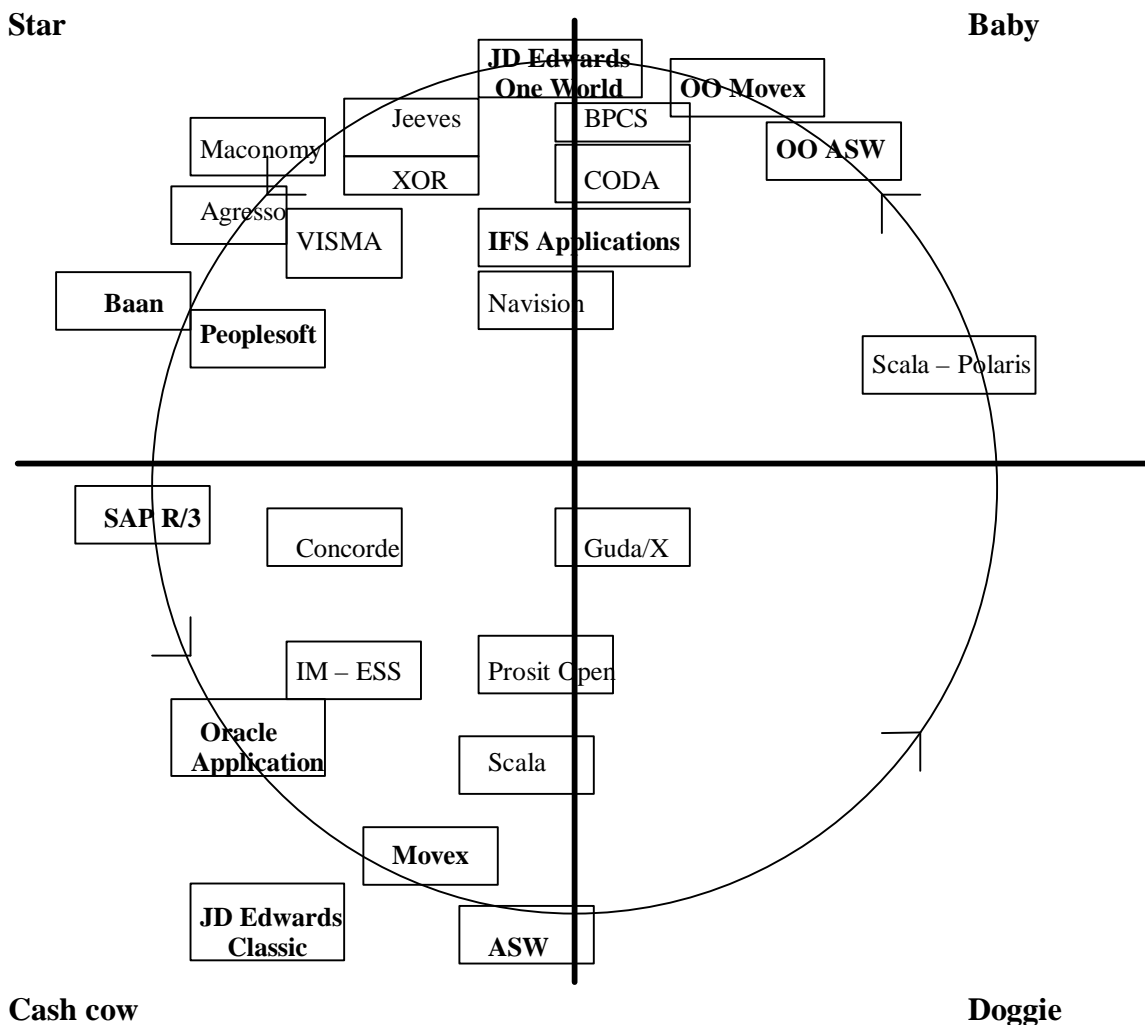


Figure 4.5.1: The products' positions in the life cycle, July 1998, Sören Janstål, DPU

OO in the figure means that the system is object oriented. Hence, the system is independent of platform, and you can run it on AS/400 as well as Unix and NT.

Characteristics for technology, vendor, support, functionality, liability, costs and installation base can be classified in following way:

Star	Baby
Technology: Mature modern Vendor: Growing or established Support: Structured Functionality: Many add ons and new possibilities Liability: More and more stable Costs: Moderate Installed base: Rapid growing	Technology: Hot and immature Vendor: New vendor or established Support: Improvised Functionality: Basic Liability: Childhood sickness Costs: Low Installed base: None/few
Technology: Face-lifts Vendor: Established Support: Bureaucratic Functionality: New add hoc's Liability: Stable Costs: High Installed base: Large	Technology: Old Vendor: Declining Support: Passive without actions Functionality: No development Liability: Unstable Costs: Unacceptable Installed base: Declining
Cash cow	Doggie

Figure 4.5.2: Explanation of the different stages in the Boston Matrix, DPU, 1998

4.6 ERP consulting firms

The ERP consulting firms follow the development of the ERP vendors. They are very dependent on the ERP vendors. Good respectively bad times for the vendors lead to good/bad times for the consulting firms. It is therefore very important for the consulting firms to choose the right ERP vendor to partner with. One of the consulting firms pointed out that it is not possible to make business plans for more than one year at a time.

There are two major types of ERP consulting firms: local and global ones. The global consulting firms are well-known companies like IBM, Andersen Consulting, PriceWaterhouseCoopers, CSC, etc. They operate on the global market and are often partners with several ERP vendors, while the local, national, consulting firms operate on national or local basis. In Sweden there are local consulting firms like Resco, Enator and WM-data, but there are also smaller consulting firms with ERP consulting as their only business activity. The global companies have larger clients as their primary clients, while the local consulting firms work for smaller companies.

The advantages of the global consulting firms:

- A broad knowledge base with developed method for implementation.
- The ability to fly in consultants from abroad when needed.
- Can deliver their services to global clients.

The advantages of the local consulting firms:

- The clients that have chosen them see them as more flexible and convenient to work with and not as complicated as the global consulting firms. This opinion comes especially from the smaller clients that we have interviewed.
- A Swedish organisational culture.
- The big local firms do already work with most of the potential ERP clients.

The amount of consulting firms working with ERP systems has increased rapidly lately. Many companies want to take advantage of the booming ERP market, and the profits that are possible to gather here. This has led to many inexperienced consultants on the market. The spectrum of ERP consulting firms' size stretches from a couple of employees to several thousands. Today, SAP has around 20 consulting partners in Sweden. The number of certified SAP consultants in Sweden has grown from 400 to approximately 1000 during 1998. This means that the lack of SAP consultants has decreased, but the lack of experienced consultant is still a serious problem.

The ERP consulting business has had some very good years recently. The consulting firms have had no problems in getting their ERP consultants fully booked. The difficulty in finding qualified people has led to high consulting costs. When the lack of people decreases this may change. There is a tendency that the lack of people is decreasing. This does not concern experienced staff. Some of the consulting firms that we have interviewed have mentioned that all of their SAP consultants are not out on projects.

However, the demand for SAP consultants is still high and the consulting firms plan a high growth for 1999. In figure 4.6, the SAP consulting partners' size and growth figures are shown. A large part of the consulting firms started their SAP practice in Sweden during 1998.

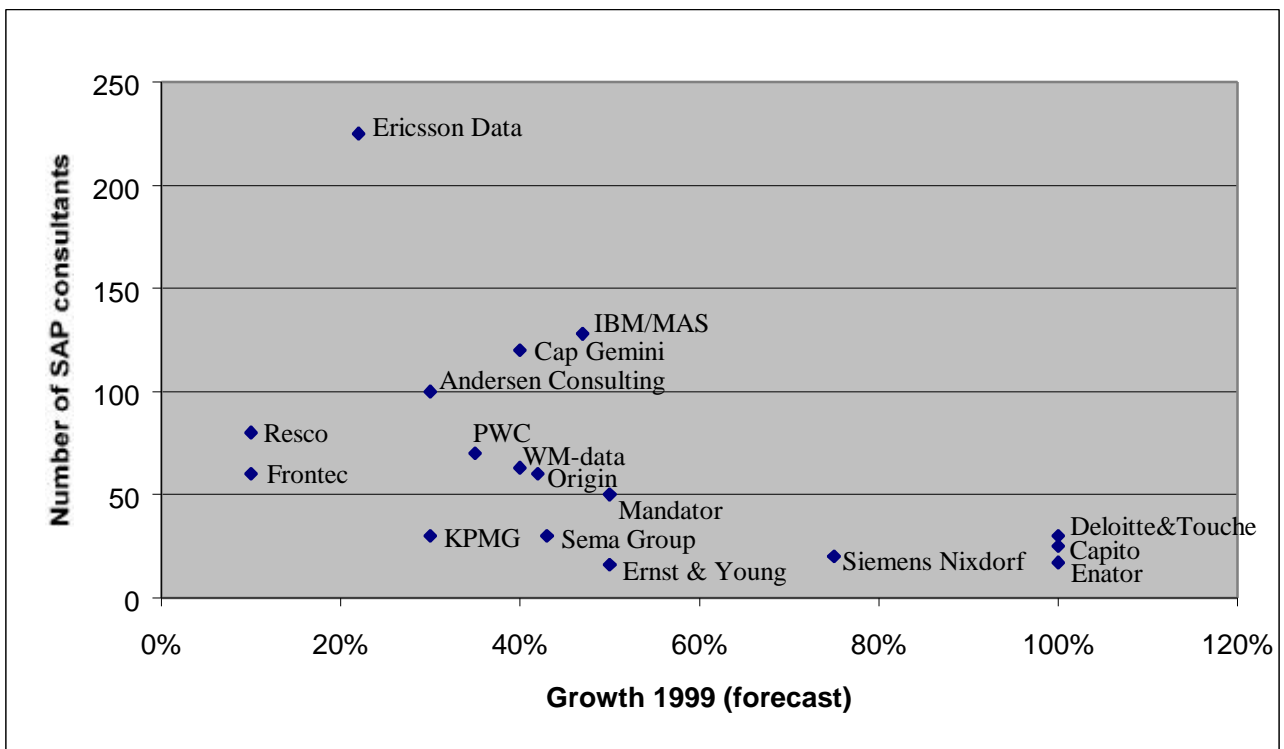


Figure 4.6: The size and growth forecast for SAP consulting firms, January 1999

The growth plans for 1999 may seem optimistic, but one should have in mind that many of these companies grew even more in 1998. Although, we believe this year's figures might be more difficult to reach than earlier. This is because of the uncertainty the millennium shift brings along. This will primarily affect the vendors but consulting partners will also notice the slowdown. In the diagram you can see that Ericsson Data is much bigger than the rest, which of course depends on the implementation work at Ericsson.

5 Trends on the ERP market

5.1 Introduction

We will start by giving a short definition of the word “trend” according to Kotler (1997): “A trend is a direction or sequence of events that have some momentum and durability”.

Successful companies recognise and respond profitably to unmet needs and trends in the macroenvironment. Unmet needs always exist, Kotler (1997)

The trends that we have described are the following:

- Market trend overview
- Adapt organisations and not the ERP system
- Fewer competitors on the ERP market
- ERP for small and middle-sized companies
- Componentisation
- Industry solutions
- Supply Chain Management
- E-business and E-commerce
- Outsourcing

Year 2000 projects require so much resources from the companies' IT departments that development work on other areas has been put aside. Therefore, we believe that much development will start after the millennium shift.

There are also some trends that do not really exist today, but we believe they will come in the near future:

- Decision support
- Technical focus → strategic focus
- Implementation → business development
- Impact of the Euro
- Industry sector → service sector

5.2 The market trend

There is an active discussion about the market trend after year 2000. Some analysts believe that the market growth will slow down, whereas others think that it will continue to grow as before. AMR Research, Inc., the leading industry and market analysis firm specialising in enterprise applications, predicts that the ERP market will grow at a compound annual growth rate of 37 percent over the next five years. This conclusion is in contrast to other forecasters who believe that the ERP demand has been artificially stimulated by year 2000 concerns.

We believe that the market will continue to grow, but it will not grow in the same way as before. ERP clients have lately purchased an ERP system for technical reasons, see chapter 5.12. The system has in most cases been implemented as fast as possible and the clients have not been able to fully benefit from it. This is much due to the millennium problem. We believe that many clients who have an ERP system today are

waiting for Year 2000 before developing their use of the system further. They are afraid and tired of doing something before the millennium, because they have other Year 2000 projects running. They want to wait and see what happens, and then start to work with their ERP system.

Some analysts talk about market stagnation after year 2000. Instead, we believe that the market stagnation will occur from the third quarter of 1999 until the second quarter of 2000. Those companies that have not bought an ERP system before the third quarter of 1999 will put their ERP projects on hold, because it is not reasonable to believe that they can “go live” before the millennium. It takes time, top management commitment, and plenty of cash to implement an ERP system. It is not the kind of thing you want to apply at this late date as an answer to the Year 2000 problems. During the first quarter of 2000, companies will be cleaning up after the millennium and will not have time to buy an ERP system or to develop their use of the system. Starting from the second quarter of 2000 the market will grow at slightly lower growth rate than today, see figure 5.2.

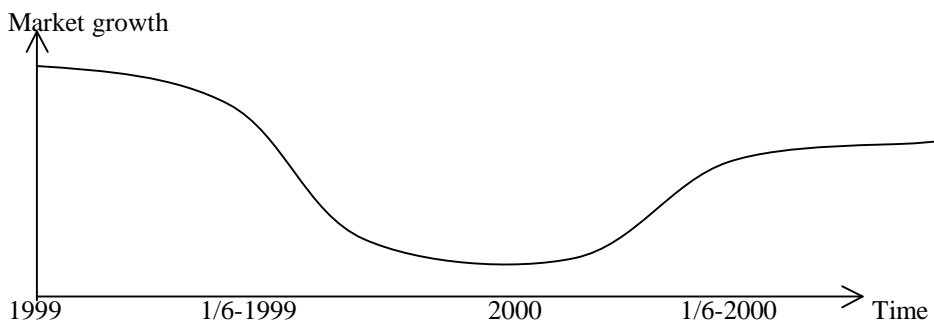


Figure 5.2: The market growth according to the authors

The market growth slow-down will be somewhat different for the ERP vendors and the ERP consulting firms. Primarily, the sales of new ERP systems will decline during 1999, but the consulting firms will have much work to do to get the systems going live before the millennium. The consulting firms can also handle a slow-down better since most of them have other business areas than ERP, whereas most of the ERP vendors are totally devoted to ERP business.

Companies are today focusing all their efforts on year 2000 and also to some extent the Euro. They are building up a large backlog of tasks that they should take care of, but they cannot handle right now. Hence, when these two problems are gone, they will start working on their backlog. Most of the clients we interviewed talked about improvement projects that will begin after year 2000. It is a fact that the companies have no real plans for the Euro, but they will soon realise that much have to be done in this area.

The future market will, however, grow in a different way. The focus will be moved from ERP implementations to business development with the use of the system. Clients that have the system will develop their use of it further and will buy supplementary modules. New clients will not be as eager as before to get the system ready for something like Year 2000 and at the same time the implementation time will be much shorter than it has been. Hence, the companies can spend more time and effort on business development with the help of the ERP system.

SAP is hoping to make its so-called New Dimension software products, those that are outside the scope of R/3 system, 30 percent of their revenue in the next five years, according to Bruce Richardsson, analyst for AMR Research.

The market will continue to grow because of the following reasons:

- Sales of complementary modules, components, to existing clients will increase, since most companies have only acquired the basic modules.
- The ERP market among small and middle-sized companies has not been as exploited as for the largest companies. It is likely that the Euro conversion will have great impact on the ERP market concerning small and middle-sized companies.
- Companies will continue to replace their old customised systems with standard applications, and an ERP system is a probable choice.
- The increasing globalisation makes it difficult for companies to have total control of their organisation. The ERP system is a very useful tool to facilitate this control.
- Increased competition forces companies to take better advantage of the IT support, which has been somewhat neglected in most companies.

5.3 Adapt the organisation, not the ERP system

A trend today is to adapt the organisation instead of adapting the ERP system. Some people mean that adapting the ERP system is the worst thing a client can do. If you adapt the system, it will be better accommodated for the company's businesses. On the other hand, adaptations are costly, complicated to carry out and will make the life of the IT director miserable when it is time to upgrade the system. Hence, many companies today try to adapt the organisation instead of adapting the ERP system. It is at least as expensive to change the organisation as the system initially, but it is less expensive to upgrade the system to new releases.

Other advantages with this course of action are that the system is easier to implement and it is easier for the companies to change its production plans.

This trend is strongly confirmed by the interviews that we have made. Many of the respondents said that if you have customised a software system once, you will not do it again. One of the clients had experience of the R/2 system, the R/3 system's predecessor, which he had adapted so much that he could not upgrade it. Naturally, he did not want to adapt the R/3 system.

An advantage of adapting the organisation and the processes is that you have to look them over. You have to go through your processes again, and that gives you an opportunity to make them even better. It can also be worth to have in mind that the processes supported by the ERP system have been developed by many people who have this kind of knowledge. One of the respondents said that it is hard to claim that you can develop better processes yourself than 7000 developers in Germany. On the other hand, the people who have developed the system have no knowledge of the particular processes in your company.

Adaptations of the system or the organisation are often necessary, but the advice from our interviewees is to adapt the organisation as far as possible. But they also say that this is difficult and takes time. The need of adapting the organisations sets management requirements on the consulting firm, which carries out the implementation. They have to be able to deliver change management capabilities.

After having installed an ERP system, you have decided in which software environment you want to “live in”. Users who make ERP systems the backbone of their corporate computing environment are finding that it affects all other technical decisions. You start by picking the ERP system and with it comes an infrastructure that largely becomes your infrastructure. When considering new hardware and software one of the major requirements is its relationship with the company’s ERP system. Data that moves throughout the company flows from the ERP transaction software. So any attached software must be able to read that data and feed accurate data back into it.

5.3.1 When should you customise the ERP system?

When you are about to acquire an ERP system, you should start by looking at the company’s processes and organisation in order to find the processes where you have a competitive advantage. This to identify the only areas where you should, if necessary, customise the ERP system instead of the processes. Processes that do not add value compared to standard should not be customised.

The boom in enterprise resource planning software and the growing interest in packaged applications for front-office functions such as sales-force automation and customer care might be interpreted as leading to the demise of custom development. But according to a survey of 200 IT managers done by InformationWeek, 55 percent of corporate applications have some form of custom development associated with them. Further, companies spend 38 percent of their IT budgets on custom development.

“What drives us to custom development are business opportunities, cost benefits, and technology advantage”, says one of the respondents. But cost benefits are not just fiscal measures – they also represent shareholder value. “If a custom application helps add to shareholder value, then it will be built. Those kinds of applications are at the core of our decision-making.”

For most companies, the amount budgeted for custom applications in 1999 will remain about the same as for 1998. Specifically, 40 percent of the companies surveyed say development spending will remain the same, 29 percent say spending will increase, and 31 percent say they plan to spend less on custom development.

Of those planning to decrease custom application development in the next 12 months, the main reason given is the emphasis on packaged applications. Cost-benefit analysis and pressures to reduce overall IT spending are also influencing the decision to trim development spending.

5.4 Fewer competitors

Most of our interviewees believe that the number of ERP vendors and ERP consulting firms will decrease shortly. Smaller companies will be bought by larger competitors and mergers between companies will occur.

5.4.1 ERP vendors

The ERP vendors that we have interviewed believe that we will see mergers between large vendors in the future. Most people think that the number of global ERP vendors will be only ten within five to ten years. It is not easy for small vendors to compete with larger competitors, much because of the research & development costs in the business. Many of the respondents think that smaller ERP vendors will have to specialise on a certain niche. It is too expensive to compete on all levels.

So far there has not been many mergers between large vendors. These have instead bought smaller ones in order to reach the smaller vendors' clients. The Swedish vendors, who run the consulting themselves, do not have the help of global consulting firms to reach new areas. Their way of entering new markets is therefore through acquisitions of smaller competitors.

Like in most businesses there are always rumours about mergers or acquisitions. During the last years, people have discussed the need of the market to consolidate, leading to a decrease in the number of competitors. However, not much has yet occurred. The reason for this is probably the market growth. There has been enough room for many companies to take advantage of the market opportunities.

Potential ERP clients will increasingly base their decisions on the future prospects of the vendor. Countless small and medium-sized software companies are expected to go out of business, merge, or be taken over in the next few years. The larger vendors will be the inevitable beneficiaries of the industry reorganisation. The Volvo Group IT strategy, for example, states that "applications shall as far as feasible be common in the Volvo Group" and "the choice of components shall be done by looking for leaders on the market more than evaluating the technically best solution", Halvarsson (1998).

The clients that we have interviewed have mentioned the vendor's size and investments on R & D as two important factors when choosing an ERP system. ERP clients also want to be sure that the vendor of the system that they choose will be around for many years ahead. Smaller competitors can have problems to convince potential buyers in this area. The normal procedure if a vendor buys a competitor is that the vendor ensures support of the system for ten years, but it is important to note that he does not ensure the development of the system. A system that is not developed for ten years is likely to be out of date soon.

5.4.1.1 The Swedish ERP vendors

If Sweden's three largest ERP vendors will survive the future will tell. Some believe they will, others do not. The three companies have chosen somewhat different approaches. Intenia and IFS prioritise growth and have shown losses or just small profits lately. The growth figures, however, have been impressive and the companies are soon reaching the revenues they are striving to attain before they will start focusing on profit. IBS, on the other hand, has been more focused on producing profit figures than the others. The company has also grown quickly but not in the same way as its Swedish competitors. It is difficult for us to tell which one of the Swedish companies that have the best opportunities on the future market. It would request a much deeper analysis of their strategies and a technical analysis of their systems. We can only bring about opinions of other actors on the market. Generally one can say that the confidence for especially Intenia but also IFS has been high and people believe they can continue to grow quickly. IBS is also likely to succeed on the future market, but some people

think that their external consulting will increase and the ERP system sales will become a smaller part of the company's revenue.

5.4.2 SAP consulting firms

We do not believe that the number of SAP consulting partners will decrease significantly in the near future. Since the sizes of the partner firms are relatively large, it is not probable that we will see many mergers or acquisitions in this area. Only two of them are totally devoted to SAP business, whereas the SAP business is only a part of the other consulting firms' revenue. On global basis, we may see some mergers like PriceWaterhouse and Coopers, but the ERP business will not be the driver for such mergers.

According to one ERP consultant, small SAP consulting partners will have difficulties to survive on the future ERP market. One important factor here is that more and more management skills will be necessary for the consulting firms, and that can be difficult for small consulting firms to deliver, see chapter 5.13.

Consulting partners like Ericsson Data and ABB Business Systems can be interesting objects when they have finished their implementation work at their home organisation. Since SAP is not core business for Ericsson and ABB, one can wonder whether they will keep all their SAP consultants.

Co-operations between the SAP consulting partners already exist today, and that will probably increase. Some of the consulting partners we interviewed mentioned that they have to co-operate because they cannot always allocate the necessary resources for the project.

5.5 ERP for middle-sized and small companies

Most ERP vendors have historically had large companies as their primary target. The market situation is now changing; the market growth among large companies is stagnating. The ERP vendors are therefore searching for new clients, preferably middle-sized, but also small companies.

The definition of a small company is less than 350 employees and a middle-sized company is between 350 and 1000 employees, according to Bengt Kallenberg, Marketing Director, SAP Svenska.

In their aim of reaching the smaller companies, the vendors are putting much effort to shorten the implementation time. This is necessary to make the systems more attractive to companies with small IT budgets. One way of accomplishing this is to pre-configure the systems for specific industries, see chapter 5.7.

To reach the potential small and middle-sized organisations, ERP vendors will have to come up with some innovative approaches to reduce the complexity and price of their products. One of the most attractive alternatives being discussed to accomplish this is to offer access to ERP solutions through leasing. Baan, for example, will offer its system for \$99 per month and user, according to Claes Granath, Marketing Director, Baan Nordic.

It will be easier than before to limit the solutions, since they are more and more built on components, see chapter 5.6. However, it is also possible to pre-configure those parts of the system that normally have the same appearance. You drop some options but you receive a cheaper, simpler and faster solution. This is a necessary step from the ERP vendors to reach the smaller companies, especially for SAP whose system normally costs more than the others do. The advantages for smaller companies to acquire a large ERP system is that they get a solution to grow in and a solution with already established process flows.

One possible success factor for the ERP vendors in their attempt to sell to smaller companies is that smaller companies may follow their larger business partners, which already have an ERP system. Many companies are vendors to larger ones that can make requirements on which system architecture that their vendors use. This to make it easier to transfer information and work closer to each other. "Small companies are drawn into using an application like R/3 because larger business partners are using it", says Byron Miller, vice president, The Giga Information Group.

We have not, however, noticed this trend during our interviews with the ERP clients. One opinion has been that it depends on which industry you are in. The automotive industry, for example, is an industry in which the co-operation between the automotive company and its vendors is close and the client may desire a vendor with the same IT structures. However, the ERP clients we have interviewed are pleased with using EDI, Electronic Data Interchange, for transferring information and see no need in connecting themselves closer to their vendors. The reason for this may be that we have spoken to the IT directors. Since he/she does not use the information that the system provides, it may be difficult for him/her to see the strategic opportunities of better information interchange. If we had talked to a production director or marketing director we may have received another answer.

5.5.1 Who will implement these kinds of solutions?

One important factor that many people have mentioned is that even if the system itself fits the smaller companies, there is a fundamental difference to work with small companies compared to larger ones. This can cause problems during the implementation since it may not be possible to use the same implementation methods for all companies. Small companies, for example, do not have the same resources to allocate people to work full-time with the ERP project.

The ERP vendors will probably be able to offer solutions at a fixed price, where, apart from the system, hardware, implementation, support, etc., are included. It will be necessary when working with smaller companies to offer a solution where the client knows in advance what it will cost, how long it will take to implement the system and what will be required from the client's organisation. The extent of these projects is simpler to estimate and these kinds of small projects will be many and more similar. A fixed price will therefore be easier to offer to small clients.

One attempt from SAP to reach smaller clients is through its new resellers. The resellers will sell, implement and consult the R/3 system to clients with less than 350 employees. Some of the existing consulting partners will also implement these solutions. There will probably be a dividing of the market among the consulting firms here. The local and often smaller consulting firms will work with smaller clients

whereas the global consulting firms will continue to work with the large international clients. The profit margins of the smaller clients are likely to be less. The price as a competitive factor will increase because of the more standardised solutions. The market for smaller companies can be large which can attract even the global consulting firms in the end.

About 75 percent of the SAP consulting firms plan to work with smaller companies, according to our interviews.

It is questionable whether smaller clients can fully use large ERP systems, even if the system is pre-configured for the client's industry. The systems are, according to the critics, too complex for the smaller companies to handle. "It is a packaged solution: you get the long-distance lorry, but you can only sit in the cabin. We will not teach you more than the cabin. You think you are sitting in a car but it goes very slowly", said Ingmar Sjöberg, consultant at Cibol.

5.6 Componentisation

The ERP vendors are making their systems more open in the form of components. Instead of an integrated system based on about ten modules, the ERP systems are now divided further into smaller components, which can be integrated if wanted.

In a couple of years time it will probably be easier to purchase certain components from one vendor and other components from another one. A difficulty is to establish a standard interface on a market that is growing at approximately 40 percent per year.

The idea behind componentisation is to take advantage of the benefits of the large systems in terms of fast access to information and combine it with the small systems' flexibility. Because of the complexity of the modules, the companies have been forced to adapt the ERP system and/or the organisation. The advantage of the smaller components is that they can be made more suitable for each company and changes will be easier and cheaper.

The componentisation has created a new market situation. The ERP vendors are facing new competitors, so-called third-party vendors who are specialised in supplying add-ons to the ERP systems. These vendors will compete more and more directly with the ERP vendors since it will be easier to attach third-party products to ERP systems and it will be simpler to compare the solutions. It is difficult to say how this competition will proceed. The advantage of the third-party vendors is that they only have to concentrate on their niche. The big ones have worked in this niche for several years, which initially can give them an advantage that is hard for the ERP vendors to match. The ERP vendors' advantage is that they have much greater revenue and therefore the capabilities to allocate resources to prioritised areas. One possible outcome is that the ERP vendors acquire their competitive third-party vendors.

The componentisation will favour both types of companies. As the systems become more open, the market for special components will grow. The third-party vendors will more easily create products for the ERP systems. The ERP vendors on the other hand will be able to take a good part of this market since it is closely connected to ERP. It is also possible for the ERP vendors to sell special components when selling new ERP systems. The third-party vendors need to produce products that are obviously better

than the ERP vendors' products in order to prove that it is necessary for the client to buy from two different vendors. Many companies find it safer to buy from only one vendor, according to our interviews. Hence, the third-party vendors need to be on the leading edge to be able to deliver the best products with the latest technology. The danger for them is that leading edge is very close to bleeding edge. A little mistake can therefore be very costly.

The componentisation itself may lead to a tougher market because of an increased number of competitors and the fact that the components from different vendors will be more alike and easier to exchange than the modules. This could lead to smaller solutions than today. On the other hand, the solutions may become even larger since it is possible to obtain a more appropriate solution than earlier. Since the components are smaller than the modules, it is easier to acquire exactly the parts needed for your company. It is therefore more likely that companies will buy supplementary components than supplementary modules. The componentisation will also make it easier to link different software systems, since the components from different vendors will be more alike than the modules.

5.7 Industry solutions

Industry solutions can be seen as part of a larger effort by the ERP vendors to ease the implementation of their products. Everyone has heard stories of ERP implementations that took two or three years. That happens, in part, because the ERP packages arrive needing to be configured for the business and the industry. By configuring parts of the package in advance for a given industry and cutting out functions not required in that industry, vendors can shorten and ease the implementation process.

Many of the leading ERP vendors have begun to organise their companies, both sales forces and development, around industry orientation. There is a wealth of industry-focused software on the market today that can complement the basic ERP systems. All ERP vendors have rich complementary software programs that encourage the connection of third-party software with their systems to solve industry-specific issues. The ERP consulting partners are also aligning themselves to different industries. SAP wants all their partners to concentrate on a limited number of industries in order to gain more business expertise, compared to their focus of today that are in many different areas.

Industry solutions are a natural proceeding on the componentisation that is getting more and more obvious. The objective is to increase the option of designing the ERP system to the company's needs instead of needing to follow the system's whole set-up. The componentisation gives the company a broader option to decide what the ERP system shall consist of. This means advantages for both the client and the ERP vendor. The vendors can customise their standard ERP solutions for different industries, but the system is still a standard application based on components. We can draw a parallel to other businesses that have headed towards a customer-focused business. The client shall have larger possibilities to define what kind of solution that will suit him best. The ERP vendors have come far in the development of industry-specific solutions, but it will become more apparent in the future.

One large problem associated with the ERP systems is the amount of time it takes to implement them. New implementation methods and other resources have been

produced to reduce the implementation time. Industry solutions make it even easier when it is possible to acquire a solution that fits the client's needs better.

The advantage with the components is that it is possible to pack a solution that is adapted to each industry. Instead of looking at one industry in order to create a specific solution for that type of company, the idea is to create many basic components. By putting these components together according to industry specific conditions, the ERP vendor can deliver a solution that suits the client's requirements better and is possible to implement faster.

In the figure below, four different industry solutions of an ERP system made of components is shown. In the figure the different solutions are Batch-oriented Process Industries, Complex Manufacturing, Forest Products and Automotive Manufacturing. You receive an industry solution by choosing the necessary components for the industry. Components can be:

- Inventory
- Time management
- Accounts payable
- Client orders
- Etc



Figure 5.7: Four different industry solutions of the same ERP system (in this case IFS Applications)

5.8 Supply Chain Management

A company's supply chain is comprised of geographically dispersed facilities, such as plants, distribution centers, sources of raw materials, customer warehouses, and transportation links carrying raw materials. The facilities include physical entities operated by the company's vendors and clients as well as those operated by the company itself. In managing its supply chain, the company is concerned not only with cost but also with service, quality and time factors that can strongly influence its success in the marketplace.

Traditionally, companies have employed a variety of methods to solve unpredictable supply and demands problems. Some have built excess inventory, stored finished products or sub-products in company warehouses, or moved them out to distributors or customers. Some have added capacity through plant and personnel expansions, while others have outsourced jobs when production demands ran higher than expected. The disadvantages of these solutions – higher expense, lower profit margins and reduced flexibility – have made them increasingly unacceptable.

Although the term Supply Chain Management has been around since the early eighties it has only recently found widespread use. It refers to the philosophy that a firm's competitive advantage depends on how well it achieves integrated planning of the activities in its supply chain.

5.8.1 ERP's role in Supply Chain Management

Practical developments in Supply Chain Management have grown in the 1990's due to advances in IT support. Gains in computing speed, communications, and the power and flexibility of data management software have promoted a range of applications. Furthermore, widespread implementation of ERP promotes integration of supply chain activities. In many companies, however, the scope and flexibility of installed ERP systems have been less than desired or expected, and their contribution to Supply Chain Management has yet to be fully achieved. Software tools are letting companies link their enterprise resource planning systems with those of their business partners to speed the delivery of goods and services.

Hence, the role of the ERP system in the supply chain is to deliver the right information. In an internal Supply Chain Management the ERP system is available for use within the company. The ERP system covers the whole supply chain information flow from purchasing of raw material to product delivery. Here, the goal is to obtain an optimised supply chain within the organisation. If we look at it further, it is possible to make the supply chain even more efficient if we exchange information with our external vendors and customers, see figure 5.8.1.

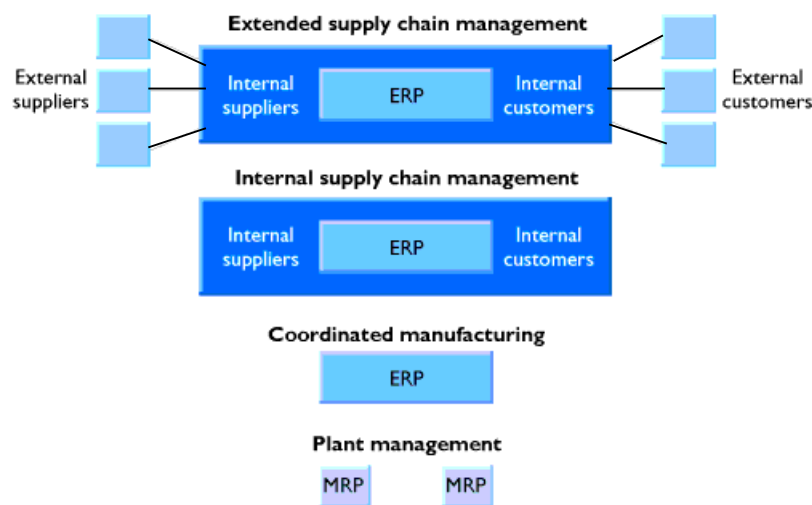


Figure 5.8.1: ERP's role in Supply Chain Management, Forrester Research

If we give our vendors access to some information of our ERP system they can, for example, see how much of a certain product that we have in stock and what we plan to manufacture. With this information it is easier for our vendors to estimate our needs. The same relationship applies between our company and our clients. If we have information about their stock, it is easier to make forecasts. To go even further we can connect our vendors and clients. If our vendors know the needs of our clients in the last distribution chain, their forecasts can be even more efficient.

5.8.2 The Supply Chain Concept

Supply Chain Management is the planning and control of the flow of the goods and services, information, and money back and forth the supply chain from the acquisition of raw materials to the final product is in the hands of the ultimate customer. Supply Chain Management determines the speed and time to market, as well as the amount of inventory an organisation must carry at any given time. Therefore, Supply Chain Management largely determines the overall cost of goods as well as client service and satisfaction. When considering supply chain integration, it is really a matter of extending the enterprise.

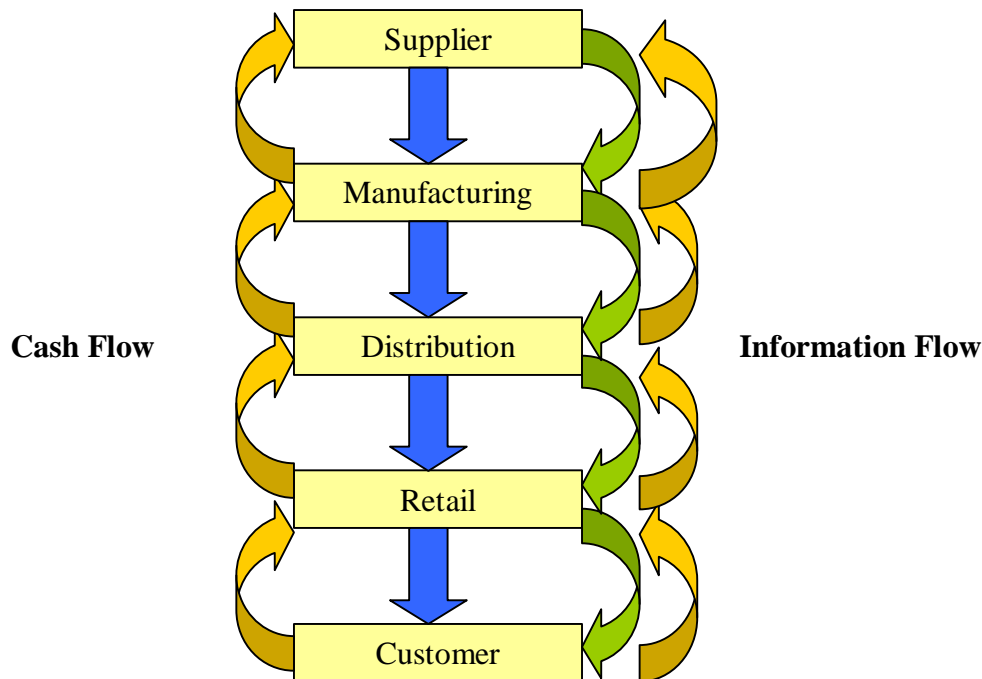


Figure 5.8.2: Supply Chain Management

The difficulties for companies where Supply Chain Management could be a solution are:

- How far can a plant decrease inventories and still ensure quick customer response?
- How low can machine utilisation go in exchange for a wide range of niche products?
- At what point will market share gains make up for the lost margin of lower prices?

The challenge of ensuring the plant activities result in revenue-generating production has grown more complex. Restructuring is forcing dramatic changes in the way business is conducted. Concurrent pressures from stockholders, clients and market competition are squeezing manufacturing plants in terms of efficiency and profitability. Changing markets and customer demands, shorter product life cycles, and global competition are the norm. As many companies have discovered, the data required to follow orders from entry through execution through delivery has grown exponentially with product variations. The challenge for manufacturers today is how to remain agile, productive and profitable – in spite of continually changing circumstances.

A Harvard Business Review study confirms the correlation between a manufacturer's survival and speed of output/time to market. The report indicated that, in a given period

of time, successful companies commercialise their products and processes two or three times faster than competitors of equal size and bring those products to market in half the time. Furthermore, introducing a product six months after the market leader reduced cumulative profit by one-third whereas being first to market and 30 percent over budget trimmed profit by only 2.3 percent, according to the same report. Accordingly, the single most important source for competitive differentiation among manufacturers over the next decade will be the ability to change quickly. In figure 5.8.1, you can see the amount of companies using Supply Chain Management today and the expectations for the future.

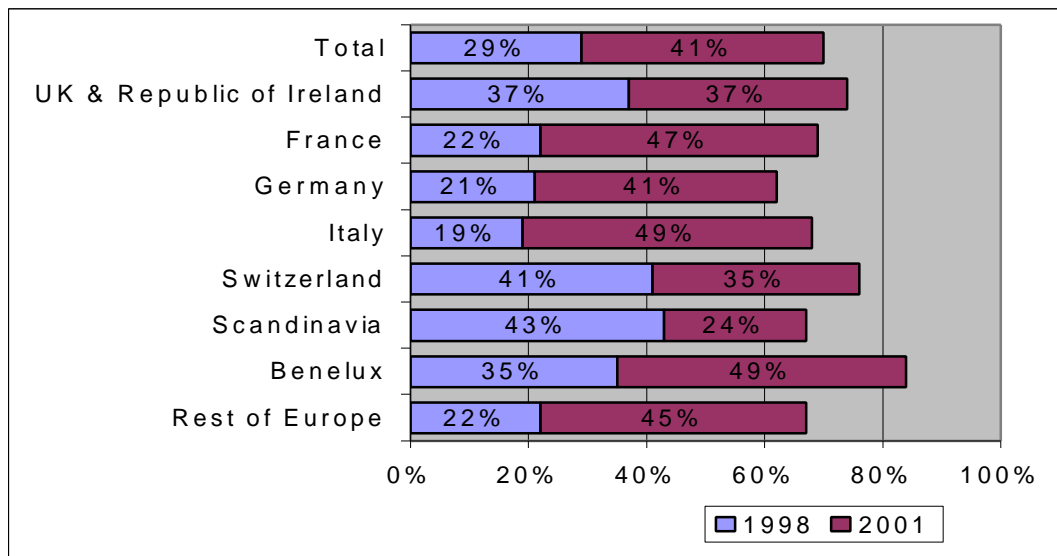


Figure 5.8.2.1: Companies using Supply Chain Management, KPMG E-commerce Report (1998)

The KPMG report has investigated 459 European companies with revenue of at least 300 million USD. Since the ERP system is one way of managing the supply chain, Supply Chain Management may be a driving force for ERP sales.

Information relating to demand in a supply chain is often distorted from one part of the chain to the other. Such distortions, known as the Bullwhip effect, lead to tremendous inefficiencies: excess inventory, poor customer service, loss revenues, misguided capacity plans, ineffective transportation and production schedules, and so on.

5.8.3 The Bullwhip effect

Logistics executives at Procter and Gamble were examining the order patterns of one of their best selling products, Pampers diapers. The sales of the product at retail stores were fluctuating, but the variabilities were not excessive. However, as they examined the order placed by the distributors to P&G, they were surprised that they exhibited a much greater degree of variability. Interestingly, when P&G executives looked at their orders of materials to their suppliers they discovered the swings and variabilities were even greater.

Sales estimates and forecasting are usually done separately by retailers, manufacturers, and suppliers. When retailers notice a slight increase in demand for diapers, say, besides putting in an order with the wholesaler to replace the diapers sold, they may order extra in case the small upturn in sales indicates a trend. The wholesaler gets the order, sees an upstick in diaper orders, and makes its own forecasts – which are blurrier

than the retailers' because they are not based on any real sales figures. Then, when a manufacturer tries to interpret orders coming from the wholesaler, the perceived increase in demand can become further exaggerated: the bullwhip effect.

To get around this, Seungjin Whang, Associate Professor of operations, information, and technology at the Stanford Business School, has brought about some suggestions. Information about demand at the site farthest downstream must be available to the upstream sites. In other words, retailers must tell manufacturers exactly how various items are selling. This gives the manufacturers necessary data for making sound plans for the future. An ERP system facilitates the information handling between companies and is one enabler for solving the Bullwhip problem.

5.9 E-business and e-commerce

E-business can be described as the business transformation that occurs by exploiting the benefits of enterprise integration and global network connectivity. E-commerce is the transactional business process of selling and buying via the Net.

The ERP vendors provide back-office accounting, supply chain, payroll, and manufacturing systems that interact with e-commerce systems to process orders, ship goods, and generate payments.

There are two fundamental ways you can use the Web to support e-commerce:

- Using the Internet as a router for e-commerce transactions and transaction-related notifications and documents between two parties.
- Using workflow to connect internal systems and external Internet service provider systems to create new types of e-commerce "value-chains" between business partners.

Connecting clients and vendors more closely to the organisation can be achieved by giving them access to the organisations information system, in some cases the ERP system. By receiving more information in real-time that is easier to maintain than manual variants, you will create gains for all parties. If the external clients can perform some work on their own, like ordering goods, the organisations administrative function is relieved and business communications go faster. The external parties can also integrate these functions in their own systems. The most common form for this kind of information flow is EDI, Electronic Data Interchange. But, align with the widespread of Internet lately the need for Internet based solutions for this has increased. Such solutions are often cheaper, since the initial cost for EDI is high.

Electronic Data Interchange (EDI) and Electronic Funds Transfer (EFT) software service providers were delivering e-commerce long before the business world discovered the Web. The Internet has not significantly changed what either EDI or EFT software does, only how it does it.

In the past, users of EDI and EFT software typically transmitted transactions between a buyer and a seller or a remitter and a bank via a privately run, value-added network (VAN). This locked people to a particular communications infrastructure and service pricing structure. Today people increasingly use the Internet as the router for EDI and EFT transactions. Some companies have begun moving some of their EDI transactions

processing onto the Internet and many banks are rolling out Internet-based online banking services, which indicates that EDI and EFT on the Web are considered safe.

The Web is affecting EDI in other areas by supporting better visibility into transaction exception handling queues, putting a friendlier front on it with Web storefronts and reducing the cost of EDI software. For less than \$200 you can order an EDI-based e-commerce application that integrates a Web-based electronic storefront builder and EDI transaction transmission with an accounting system. This type of product means that the entry barrier for small businesses to take advantage of EDI transmission of sales orders, for example, is largely a thing of the past, because of the impact of the Web. The most important advantages for e-commerce to a company can be seen in the figure below, where KPMG has investigated 457 companies in Europe.

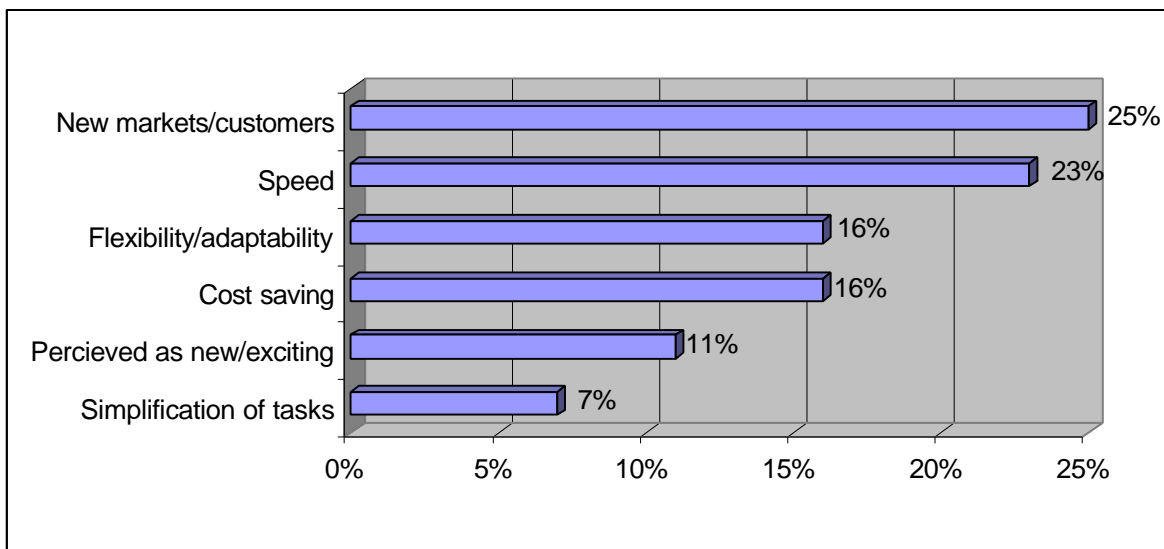


Figure 5.9.1: Single most important advantage of e-commerce to a company, KPMG report (1998)

Business-to-business e-commerce for the leading ERP vendors is still largely EDI-based, with initiatives focused on connecting Web-based storefronts and allowing Web-catalog driven procurement. Nobody really knows what impact of an all-Web deployment of an ERP suite will be on an enterprise wide basis with full Web e-commerce. All the ERP vendors are focused on the use of Java for programming Web-related server objects and delivering Web browser access to application functionality.

According to IDC, the web-based e-commerce sales amount will increase to 3 400 billion SEK in the year 2002, see figure 5.9.2. 79 percent of the sales will be business-to-business.

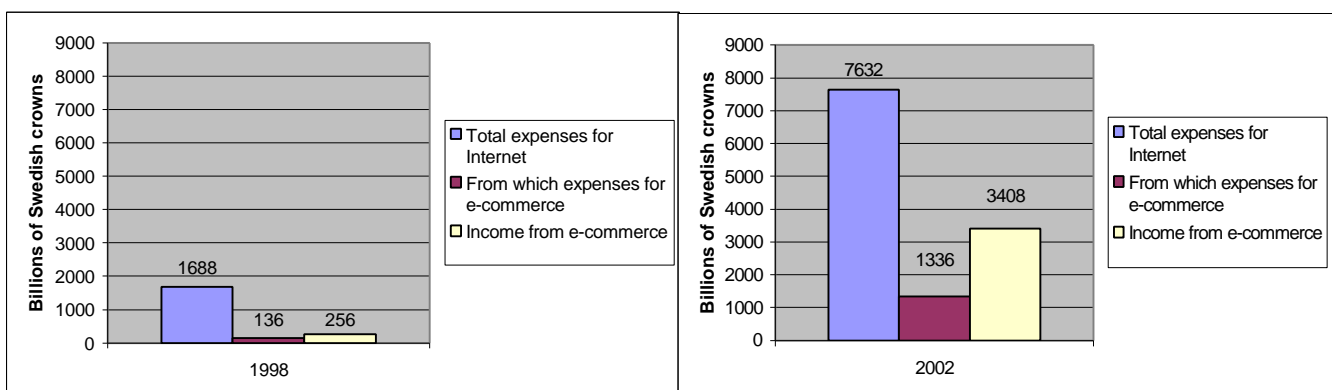


Figure 5.9.2: The future of the Web-based e-commerce, IDC (1998)

The US is dominating the e-commerce. 87 percent of the total income from Internet is generated here, according to Interactive Media in Retail Group (July 1998). Web e-commerce has a long way to go before it becomes an integral part of the functionality that is expected from ERP suites. An important first step for all vendors is to ensure that they can seamlessly integrate Web-based services within current application process workflows. In this way, the vendors can extend the reach of their applications beyond the boundaries of conventional functional modules to make the vision of an extended-enterprise extranet a reality for their customers.

The disadvantage of Internet is the lack of security. The inability to route application requests securely is the big problem and it is not going away quickly. Also the lack of potential customers is still an entry barrier for the web-based e-commerce, but we will see a large growth in this area. KPMG lists the entry barriers for e-commerce as follows:

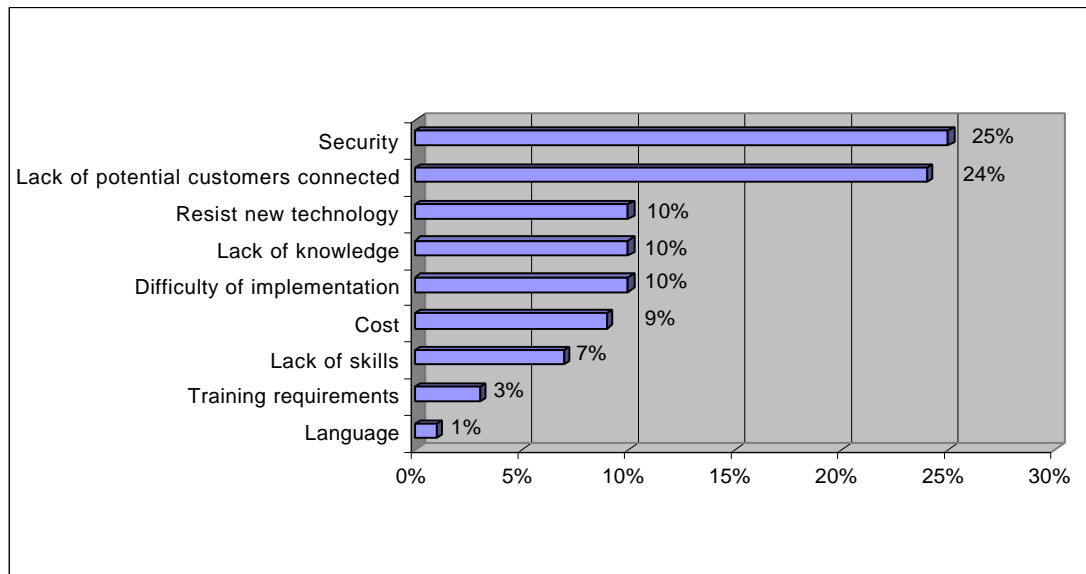


Figure 5.9.3: Most significant barrier to implementing e-commerce, KPMG Research report (1998)

5.9.1 E-supply chain

E-supply chain refers to the management of the supply chain using Internet technologies. Eighty percent of businesses use the Web today, although less than seven percent use it in support of Supply Chain Management, according to Jim Turcotte, IBM Corp. Logistics.

An Intranet is an internal net that is normally used within the boundaries of a company. Companies are linking their ERP systems, or at least making information available from their ERP systems, to the Intranet. Intranets are protected from outside access by a "firewall". Extranet is an external Intranet shared by two or more companies. Each participating company moves certain data outside of its private intranet to the Extranet, making the data available only to the companies sharing the Extranet. An example of this use would be providing inventory data to your supplier to help support an automatic replenishment process. Last but not least is the Internet with which we are most familiar. This form is open to the general public. The Internet tends to be used more for e-commerce today, but has some emerging uses in Supply Chain Management, such as advertising surplus inventory to outside brokers.

5.9.1.1 E-supply chain, one example

We will show this by using an example created by Turcotte et al. (August 1998). Imagine that you are a toothpaste manufacturing company called TastyPaste. Not just any toothpaste, but the new flavoured type that all the kids want. Yes, you have 99 flavours from bubble gum to apple-flavoured toothpaste. You sell it to 250 retail chains throughout the world, which translates to thousands of retail stores and millions of consumers. You purchase the flavour additives, tubes and other materials from 50 suppliers. The question is: given the complexity of this supply-demand environment, how can you manage the supply chain to achieve the right balance of customer responsiveness and low inventory levels with an aggressive product cycle time.

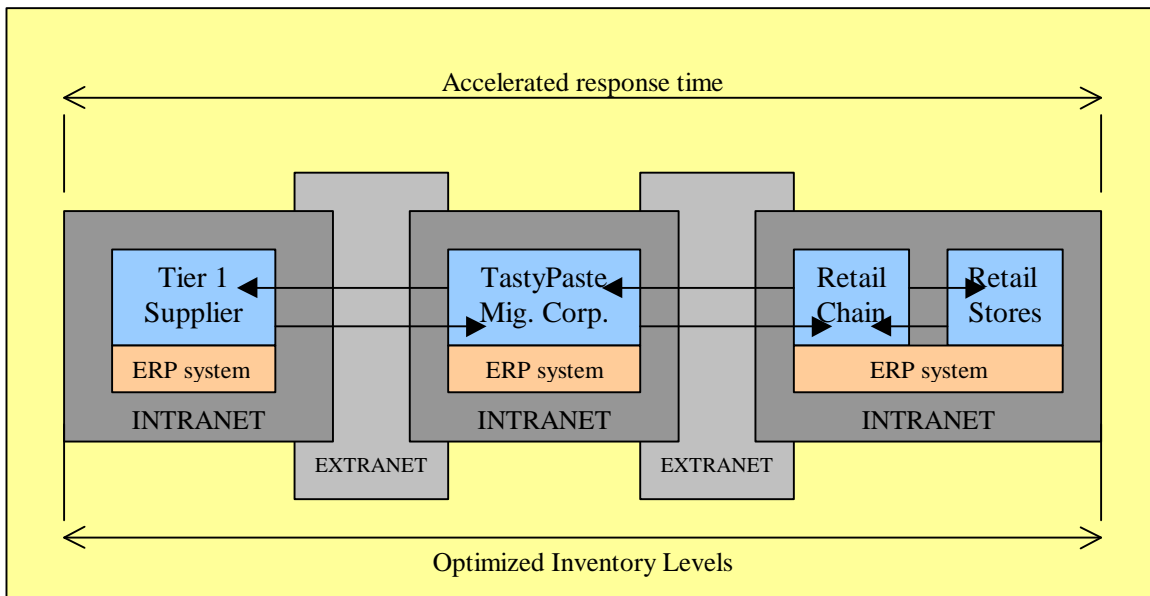


Figure 5.9.1.1: E-supply chain, Turcotte et al.

Now imagine for a moment that TastyPaste's direct customers, the retail chains, have provided access to their inventory data through a shared data Extranet. As consumer purchases occur, the data is fed to the retail chain's ERP system. The retail chain then moves the updated demand data to the Extranet. At this time, the critical data is automatically fed to the TastyPaste's ERP system. This system runs and makes the appropriate quantity and schedule adjustments. The key output is copied to the Extranet set up between TastyPaste and its 50 suppliers. This data might include updated inventory snapshots as well as updated forecasted demands and orders for additives, etc. Based on the data the suppliers can obtain through the Extranet, they automatically replenish TastyPaste's inventory and adjust their own ERP gross requirements to meet demands. The end result is the real-time update of demands from the consumer to the raw material suppliers.

The TastyPaste company has created what amounts to a seamless environment that stretches from customers right through to suppliers. Customer demand flows to those who need it, when they need it. And this supply chain capability is not limited to a single tier of customer or supplier, but can extend to multiple tiers of both. The bottom line is that they have created an integrated enterprise through the global connectivity of the Net.

So just how does e-supply chain benefit us? The objectives of any company are to reduce costs, reduce cycle time and grow revenue. E-supply chain supports these

objectives by doing everything from improving the effectiveness of customer-supplier relationships to enabling faster customer response. World-class competitiveness demands a closer relationship with our supply chain partners and the building of “value-based” relationships. The quicker we can move data through the pipeline, the quicker we can react and hence, deliver the end product to our customer.

5.10 Outsourcing

Outsourcing is a term describing when a business, or part of it, is sold or contracted to an outsider. Companies are nowadays finding it much more cost-effective to focus on their core business and leave other businesses to experts.

The idea of IT outsourcing is that an outside company – like a consulting firm – runs the software system on servers at a central location, taking on all the implementation and maintenance responsibilities itself.

Since outsourcing is a widely used word we have chosen to describe different types of outsourcing in Appendix B.

5.10.1 Outsourcing - pros and cons

What are the advantages and disadvantages of outsourcing the ERP environment.

Pros

- Scale economics by the vendor can reduce operation costs for the client, and minimise the client’s investments.
- A reduction of the client’s responsibility concerning development and the running of the IT service.
- The client can devote itself to its core business and focus on maximising its competitive advantages on the market.

Cons

- The client loses control of its IT service.
- It is difficult to turn back from outsourcing. This is a risk when having signed an agreement with a consulting firm, since the consulting firm has its own interests to protect.
- The IT service needs steering and follow-up of the consulting firm.

5.10.2 ERP Outsourcing

Although IT outsourcing is by no means a new idea, it is an emerging business model on the ERP market and it is gaining more attention. Outsourcing exists already in the ERP area, but is so far not very widespread. Almost everybody we have interviewed believes that outsourcing of the ERP system will increase.

The ERP clients that we have interviewed run their ERP systems by themselves but hire consultants when they run into problems. Most of them have some form of relationship with the consulting firm that assisted them during the implementation. The most common relation is a contract where the client is guaranteed help from the consulting firm if a problem occurs within a specified time period.

To have the ability to run the ERP application, in the form of a partnership outsourcing agreement, can become a strong competitive factor and a selling argument for the ERP consulting firms.

5.10.3 Why outsource the ERP system?

A reoccurring problem for all companies in the ERP business is the lack of skilled people. Especially the ERP clients suffer from this problem. It is hard for them to keep the employees that achieve good knowledge of the system, the so-called super users. They often leave the company for a job at a consulting firm. It is also difficult to hire people with good knowledge of ERP systems. Therefore, it is difficult for ERP clients to build up enough competence to be able to run the system by themselves. To run the whole ERP environment you need to cover several different competencies, which requires about one employee per module.

For small and middle-sized clients it is even more difficult than for large ones to build up an ERP organisation. One way for the ERP vendors to reach these companies is outsourcing, which can be an attractive alternative for smaller companies with lean IT budgets. The price of an ERP system, implementation included, may be as high as the company's normal IT budget. It can also be very expensive and time-consuming to find employees with high ERP expertise.

On the other hand, some organisations see their ERP system as a strategic resource. What is strategic you do not outsource is a common theory, and ERP systems can be seen as a strategic because it is closely intertwined with what the company do.

We have also asked the ERP clients that we have interviewed what they think about outsourcing of the ERP service. They believe that it could be a good thing to do, especially for smaller clients. The main reasons are the difficulty in finding competent people and building an organisation that can manage the ERP system. "Outsourcing is necessary for smaller companies, especially parts that are not strategically important and this concerns larger companies too", says Dag Åselius, IT Director, Tibnor. He continues by saying "I do not have as much problem, hopefully, that I have work for him every day", referring to the advantages of outsourcing services that do not need a full time worker. However, a consultant at a consulting firm can operate several clients at the same time, which is more cost-efficient.

The demand for enterprise resource planning consulting and implementation services has been strong for several years. But many businesses, faced with lack of IT staffing, are now turning to ERP vendors and services firms to get help with the ongoing management and maintenance of their ERP software and hardware, according to Marianne McGee, InformationWeek.

Most businesses have easily acknowledged the need for outside help to design and implement their ERP systems, but many do not initially realise that it may be just as complex to manage these applications. "Many companies just don't have the resources to manage their ERP systems" says Allie Young, principal analyst at Dataquest. "It's difficult to train internal IT people to do this, and it's even more difficult to keep them once they're trained". One of the issues of implementation is that once you have implemented the system, problems do not go away. You need an extensive talent pool to keep it up-to-date and to apply fixes and upgrades, and this is not cheap. If you

outsource it, all you have to worry about is applications, entering data in and extracting it out.

Outsourcing the management of ERP systems helps businesses free IT resources to focus on the next set of technology and business challenges.

5.10.4 The ERP outsourcing market

Still, the big question that remains is how large the ERP outsourcing market will become. According to Meta Group, Inc., the ERP consultants anticipate an ERP outsourcing worth as much as \$8 billion a year on a global basis.

Most of the major ERP vendors have announced plans to either set up their own outsourcing services or partner with others for the jobs. About 65 percent of the SAP partner consulting firms in Sweden plan to deliver outsourcing services, according to our interviews.

According to a report made by Visio, where 446 Nordic Enterprise Application (primary ERP) clients were investigated, 14 percent of the organisations in Sweden have outsourced the whole application environment. Sixty one percent of Swedish companies have not outsourced and are not going to outsource any parts of their enterprise applications environment.

World-wide, some large ERP outsourcing contracts already exist. Dow Chemical, for example, has awarded a consulting firm a \$550 million outsourcing contract. Dow spends more than \$4400 million annually on IT resources. However, we have been unable to find any such contracts in Sweden.

“The leading process to be outsourced today is payroll and HR processing, specifically in small to medium-size companies”, says John Burke, SAP senior vice president of outsourcing.

5.11 Decision support

The difficulty for many corporate decision-makers today is the large amount of information they are forced to handle. They do not have the time to analyse all the information that is available. At the same time the competition between companies is increasing, making it vital to take advantage of every possible piece of information that can be of great importance.

5.11.1 History

The very first commercially used computers were mainly used for rationalisation, they automated routines that were previously carried out manually. These computer-based information systems were called transaction systems, because, in simple terms, they managed numerous transactions. Examples of transaction systems are bookkeeping systems and wage management systems.

Transaction management systems generated large quantities of data as a form of by-product and these were stored in information systems' databases. In the 1960s, the idea came that this data could be used to create different types of reports, which could be

used by decision-makers. In response to this, a new type of information systems was created, the so-called Management Information System (MIS). The reports created by MIS were standardised, pre-specific reports that were delivered at different intervals.

The use of Decision Support Systems, DSS, is not widely spread in Sweden, but many companies plan to use it, see figure 5.11.1.

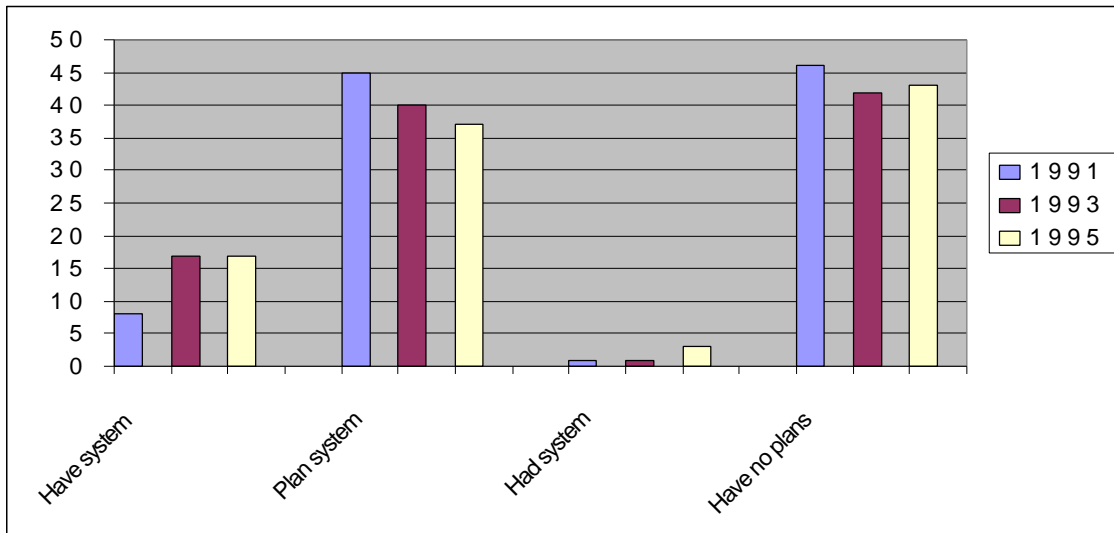


Figure 5.11.1: Use of Decision Support Systems in the 200 largest companies in Sweden 1991-1995, Lundberg & Sundgren (1996).

5.11.2 Decision Support in ERP

As more and more companies acquire ERP-systems, the ability to get information is even greater. That extra information is not always welcomed with open arms, however, because of the difficulty of handling it. You may also receive new types of information that is difficult to measure since you have not got any historic values to compare them to. As one of our respondents said concerning some information he received from the ERP system: “Whether these figures are good or not we cannot say because we have never been able to obtain them before”.

Many companies have for a long time planned to start using Decision Support Systems. Normally, the plans go no further, see figure 5.11.1 above. Even though the use of computers have reached a higher level in almost every company during the past years, the use of DSS have not gained any market shares. The fact remains; it seems difficult to introduce DSS.

We believe that DSS will reach a broader market when introduced as an extension of an ERP-system. Then it will be easier to get going compared to if you will have to buy a system externally. Since the ERP systems are getting more and more open, it also becomes easier for third-party vendors to attach their DSS products to the ERP system as well. Hence, their sales to existing ERP clients will increase. ERP vendors are at the same time developing integrated DSS components in the ERP system. Therefore, we believe that the DSS market finally will take off.

5.12 Technical → strategic focus

In this chapter we will discuss how we believe there will be a change in the way companies look upon acquiring an ERP-system.

When you buy an ERP-system you can look at the change of system, as mentioned before, from two different perspectives. You can look at it with a strategic or a technical point of view. All the companies we have talked to have focused on the technological matter. Important factors have been that the old system would not be able to manage year 2000, or simply that the old system was “falling apart”.

5.12.1 Perspective today: Technical solution

It has been the IT Directors of the companies we have visited that have taken the initiative to change systems. This is because of the focus on technology we have discussed before. However, to get something more out of the change of IT structure, the solution has been an ERP system, because it has a lot of potential for the future. The top management’s function has been to allocate resources. The goals have in the end been to as fast as possible replace the system and take it from there in the future.

We believe that depending on where the idea to exchanging systems emerges will have a great impact on what the final solution will look like. In figure 5.12.1, we have described the decision-making process in the companies we have visited. The idea of replacing the old systems with an ERP system originates from the IT Director, since the old systems had to be replaced or modified because of new requirements. The obtained information system infrastructure sets new requirements on the organisational infrastructure, and the business strategy is accordingly affected. This is one of the reasons that many companies now want to further develop their use of the ERP system. The management has started to realise the systems potentialities after it has been implemented.

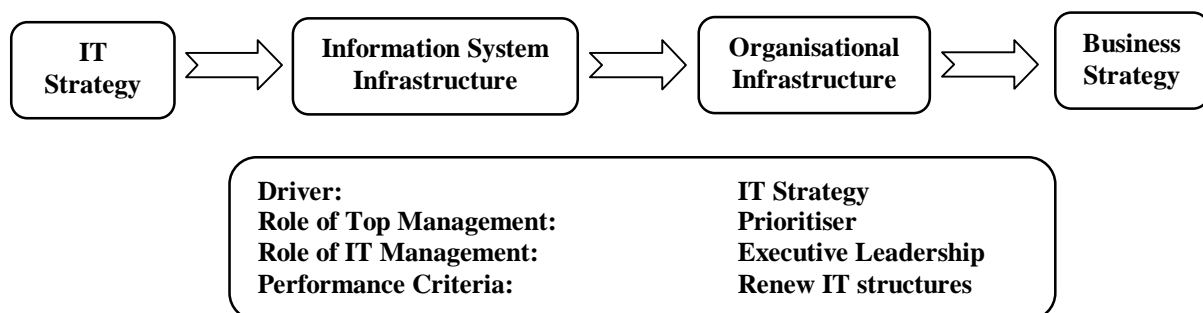


Figure 5.12.1: ERP acquisition perspective today

An ERP-system is, of course, in itself a technical solution as you often replace a number of old systems with a single big one. The difference compared to ordinary “system shifts” is that besides being a technical solution the ERP-system gives access to so much information that it will affect the way you run your business.

Many of the companies that have acquired the ERP-system lately have not had the time to consider the potential strategic benefits that you could achieve with this kind of system. This we believe will change. The companies that have not yet acquired an ERP-system but have the intention to do so the following years will be more aware of

what the system can do. The ERP system is now getting more and more widespread and many companies have been in touch with it to some extent.

5.12.2 Future perspective: Competitive potential

We believe that the technical point of view will change to a more strategic one. The specific role for top management will be the business visionary, who articulates how the emerging IT competencies and functionality could impact the business strategy. The role of the IT manager, in contrast, will be the catalyst, who helps to identify and interpret the trends in the IT environment to assist the business manager's understanding of the potential opportunities and threats from IT. Usually technology has set the limitations for what you can do. This is now beginning to change so that technology more and more becomes a solution provider.

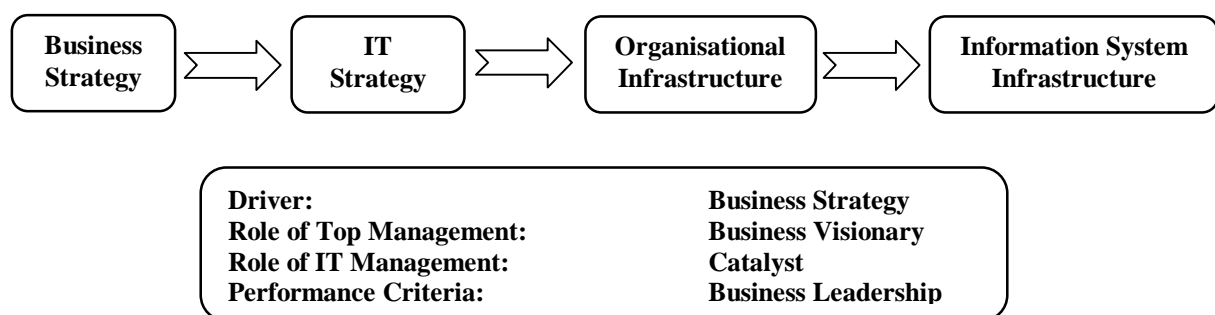


Figure 5.12.2: Probable ERP acquisition perspective in the future

Historically, IT was easier to comprehend, in that its main role was seen as automating well-understood functional activities. Today IT is more seen as an opportunity to rationalise and make the company's processes more efficient.

Multiple factors will affect the market to a more strategic point of view:

- IT knowledge will increase among Top Management.
- The technical driver Year 2000 disappears.
- Increased global competition.

5.13 Implementation → business development

The reasons for acquiring an ERP system have almost exclusively been technical among the companies that we have visited. The old systems were not supported, could not handle Year 2000, etc. So the company saw it primarily as a technical change of IT system environment. They do see the strategic potential, but more as a possibility for the future. Most companies have accomplished a BPR (Business Process Reengineering) to develop their processes and thereby achieve the advantages that the new system can provide, if handled right. There has, however, been a tight time schedule to get the new system going long before the millennium. Hence, the companies have not been able to put enough effort and time into issues like process development.

In this area we see a great need in the future when these companies want to develop their use of the system. The companies have prioritised to get the system going. When the system then functions satisfactory, it is time to develop the environment around the

system, process development, etc. Many of the ERP clients that we interviewed have planned projects starting after Year 2000 in order to develop their use of the ERP system. This will require new skills from the consulting firms. Apart from being able to implement an ERP solution, it is important to understand a company's organisation. Today everything is focused on implementation, but we believe that the focus will turn to business development. Management skills among the consulting firms will therefore be necessary.

Hence, consulting firms might benefit from complementing their IT consulting with management consulting. In this area the consulting firms have different prerequisites to be capable of delivering these services. The global consulting firms often have management consultants within the organisation. The local consulting firms can have problems in building up management skills, while the global ones easily can deliver management consultants to their ERP projects.

For ERP vendors that run the implementation themselves the development will be similar. The difference is that they already have a large consulting business and global consulting firms constitute no threat since they have no expertise regarding the ERP vendor's specific ERP system. The difficulty for these vendors is to find the right alignment of the company: should they work with management issues or not? It is also a matter of resources. They have difficulties in finding resources for their implementation projects of today and resource shortages are often the limiting growth factor. If they receive requirements from already existing clients who want to extend their use of the system, this may lead to some difficulties in defining the goals of the company. Should they serve existing clients or new clients, with the risk of dropping the existing ones? The company must choose what kind of company they want to be, ERP vendor or ERP consulting firm.

5.13.1 Post-ERP drivers

End-user frustration with ERP applications often drives a business' first post-ERP projects. At Amoco's chemical intermediates group, for example, the need to channel SAP R/3 information into more user-friendly applications became apparent as the ERP system was implemented early last year. "Implementing ERP is the end of the beginning, not the end of the end", says Steve Grossman, SAP project manager at Amoco.

Unfortunately, companies that launch ERP projects do not always recognise this fact until after the implementation is complete. The target date for switching on an ERP system often become the ultimate goal, obscuring the business goals that initially were the basis for the decision to implement.

A Deloitte Consulting study of 62 companies segments post-ERP activity into three stages. The first stage entails a three to nine month productivity decline, which is explained by the need to redefine jobs, establish new procedures, fine-tune ERP software, and take charge of the new streams of information created by the platform. The second stage, which last from six to 18 months, involves skills development, structural changes, process integration, and add-on technologies that expand ERP functionality. The third stage, which is of one to two years' duration, is one of transformation, where the synergies of people, processes, and technology reach a peak.

Fifty-one percent of the respondents cited “people-related” issues as the biggest challenge after going live, compared to only 26 percent who see technology as the key challenge. The top human resource issues identified by the study were change management, training and internal staff adequacy.

“Information technology managers are fooling themselves if they think the spending stops when they finally roll out a major enterprise resource planning application”, says Bruce Bond, Gartner Group, Inc. He also told attendees at Gartner’s Symposium/ITxpo 1998 that ERP clients should plan on spending 15% of the project’s original implementation cost every year to keep their ERP systems up-to-date. That means keeping up with current releases of the software as well as moving along with changing business conditions.

5.14 Euro

The companies we have visited have not reflected too much on the implications of the conversion to the Euro. Euro-related issues were not considered when the companies implemented their ERP-systems. Focus was on Year 2000 when they made the acquisition and at most they noticed that they got a “Euro-ready” system. We believe that the Euro will have a greater impact on Swedish companies than they have anticipated themselves.

5.14.1 Background

The 15 member countries of the European Union (EU) have decided to introduce a common currency, the Euro, which will replace their local currencies. All the member countries will not participate in the initial stage, but all countries are expected to do so within a foreseeable future. The countries standing out of the collaboration to start with are Sweden, Denmark, England, and Greece. For the countries that have joined the European Monetary Union (EMU) the Euro will be introduced according to this timetable:

- From January 1, 1999, the exchange rates of the local currencies of the EMU participating countries were irrevocably locked to the EMU. From this date the Euro currency exist electronically and as traveller’s cheques.
- From January 1, 2002, Euro bills and Euro coins will replace the local currencies of the EMU countries.
- The July 1, 2002, the local currencies will be revoked.

During the transition, both local currencies and Euro will be used. No decree exists regarding which currency to use in this period.

5.14.2 Euro consequences

”Euro conversion is not an IT issue, it is a business issue with IT consequences”, says Martha Bennet, vice president of research, Europe, at Giga Information, Inc., In contrast Y2K is truly an IT issue, with business consequences if not addressed. And while the nature of Y2K is well defined, the euro is uncertain in many respects, being dependent on political as well as business decisions. Bennett estimates that the overall cost of Euro conversion for European companies will be four to six times that of Y2K.

To better understand the problem, consider the following:

- Supply Chain. Currency consideration figure heavily in business strategy, and Euro conversion will force companies to rethink strategy from the ground up. According to analysts, companies that want to trade effectively using the Euro will have to ensure that their supply-chain management systems can cope not only with the technical issues of the Euro.
- Consolidation. The switch to a single currency will lead to price transparency and will trigger consolidation of brands, leading to a stiffer competition. Price transparency means that it will be much easier to compare the price of a product in different European countries.
- Double currency handling. Many systems cannot handle several currencies at the same time, which is needed during the transition period.
- The Euro cannot be handled like just another currency. There are rules on how you have to exchange between the Euro and other currencies. You cannot, for example exchange directly between D-mark and French Francs, you first have to convert to the Euro. This is called triangulation.
- The uncertainty how to treat the Euro. Especially in Sweden since we do not know if and in that case when Sweden will enter.

One example of an organisation that has looked at the problem of how the Euro will affect the company is Telia Mobile. Its difficulty lies in the fact that all the Nordic countries have different approaches to the Euro. Sweden has not decided yet whether to join the EMU and will wait, Finland will join EMU, Norway stands outside, and Denmark has a special treaty.

According to a KPMG report where 307 large European companies were interviewed, the purpose of the companies EMU strategy was to ensure that business critical systems and processes are ready on time (i.e., operating aspects). Only a minority said it was to prepare for the effects of EMU on clients, suppliers and competitors (i.e., market aspects),

For the year to come, the expenditure on Year 2000 compliance will exceed that of EMU by a factor of 1.5 – Year 2000 compliance being allocated on average 14% of IT budgets and EMU 9%. But over the lifetime of the two projects, EMU will greatly exceed Year 2000 spending, according to the same KPMG report. Two thirds of the companies in this investigation have variable pricing across Europe and the average high-low ratio (i.e. the amount by which a company's highest price for a product or service is greater than its lowest price for the same product or service) is as much as 57%. This means that pressure on prices might result in a significant revenue squeezing for many companies. 86% of companies charging variable prices expect the price range to narrow compared to 73% last year. Two-thirds of the companies also expect prices to go down (49% last year).

That there is much to be done on this matter is quite clear. Most companies that have not analysed how the Euro will affect them, believe that there is not so much to be done. Maybe they already have a system that is "Euro-ready" and therefore feel they are practically finished in their work. On the other hand, those companies that have overlooked how the company will be affected soon have found out that the work to be done is a lot more than anticipated. We believe that the conversion to the Euro will have different impact on separate parts of the market.

5.14.3 Large companies

According to many reports, large companies have come further than small ones in their work on how to adapt to Euro-related issues. These companies also have, to a larger extent, replaced old systems with new ones, often exchanging them to ERP systems. ERP systems, in most cases, can handle the technical aspect of the Euro as an extra currency. Therefore, we believe that large companies are somewhat prepared to the technical aspect and will not have to change system because of that. On the other hand, the strategic implications of the Euro will affect them to a greater extent. So, even if you have a technical solution that can handle Euro, there is much work to be done on how you will use it and how it will affect the competition in Europe. In an investigation made by KPMG, many large companies are still implementing customised systems, see figure 5.14.3. KPMG considers that the increased number of customised solutions may create a bomb for companies that underestimated the effort of work required to fix software for EMU.

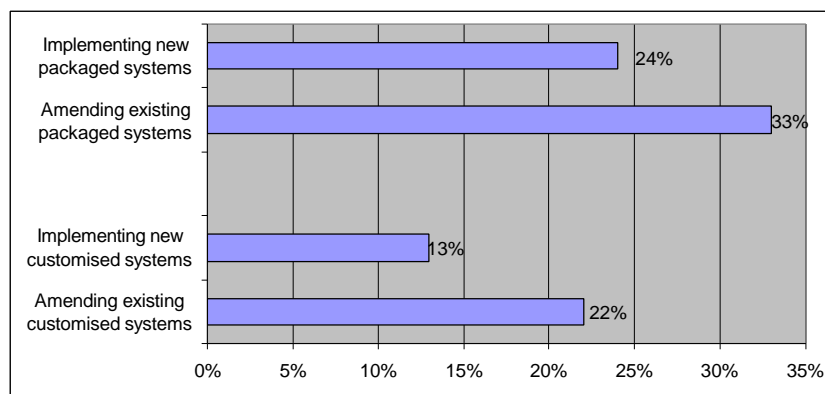


Figure 5.14.3: EMU IT strategy: Primary focus, KPMG Research report (1998)

So, while perpetuating customised systems may seem initially attractive, these decisions may not be accounting for the total cost of change.

5.14.4 Small and mid-sized companies

In this category, there are many companies that still have not prepared their systems for the new currency. They will not be affected in the initial phase as larger companies that are more spread across Europe. However, in the end they will have to adapt to the Euro technically. Here, the big ERP vendors have a great opportunity to reach out to smaller clients.

5.14.5 Swedish companies' Euro efforts

According to an investigation of 600 Swedish companies by SKOP (Skandinavisk opinion AB), only 21 percent of the small and middle-sized companies have started their EMU preparation, see figure 5.14.5. Two other investigations show that larger companies have come further.

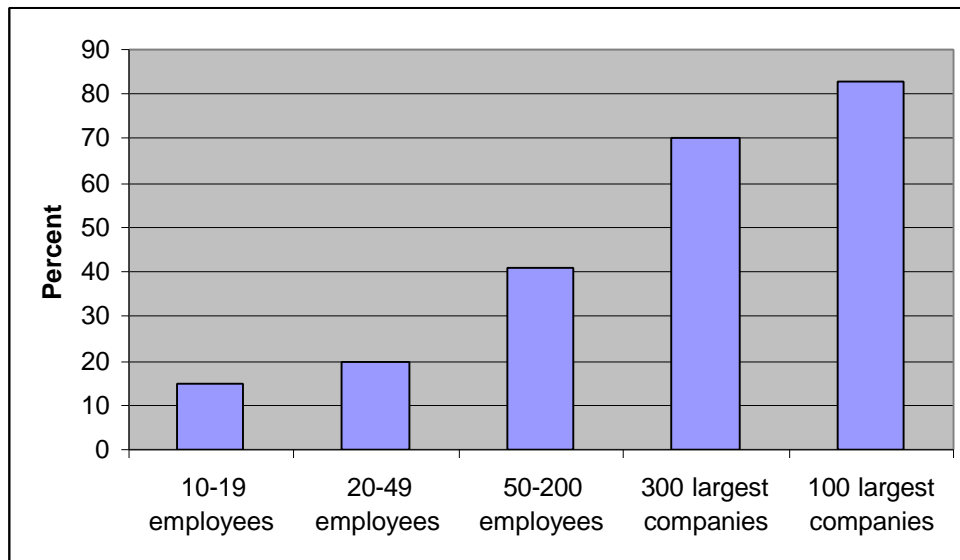


Figure 5.14.5: Part of Swedish companies that have started their EMU preparation, Frycklund et al., (December 1998)

Swedish companies have done very little to prepare for the Euro compared to other European companies. This is most likely because of the fact that Sweden is not part of the EMU from the start. The problem is, however, that most Swedish companies will be faced with the Euro from the start anyway. All companies with foreign trade will have to do business with the new currency. Another issue that has influenced the Euro conversion in a negative way is that the conversion to the Euro goes on over three years. The Year 2000 problem is different, if you cannot handle it at the first of January 2000; you will run into trouble. The Euro, on the other hand, is treated like something that we can take care of later, and many companies have not realised what kind of efforts that are needed to handle the Euro.

5.15 Industry sector → service sector

Anders G. Nilsson, Professor of Standard Packages at the Stockholm School of Economics, told us about a forgotten customer group, companies with a number of employees between approximately 20 – 200. This group is now being satisfied, see chapter 5.5. The other forgotten customer group is the service producing companies, according to Anders G. Nilsson. No ERP systems exist specifically for these kind of companies, as the ERP systems normally are made for manufacturing companies.

The number of employees in manufacturing firms is decreasing and the number of people in the service sector is increasing. Hence, ERP systems for these companies will come, the question is when, and who will be the first to develop them.

Despite the fact that an even smaller part of the population work in the industry sector, the need for the ERP systems will remain in this area. There is no direct relationship between the decreased number of people in the industry sector and the need for an ERP system. However, to an ever-increasing extent the service sector will need new tools to make the administration more efficient. Today there are applications in the area, like Human Resources, Project, etc., which can be integrated with the financial system. Still, there will be much to do in this area in the future. The needs of the industry sector have been so large that the service sector has not yet been prioritised.

6 Conclusions

6.1 *The ERP market*

The ERP market is relatively new and has grown quickly the last couple of years. The three main reasons for the growth have been globalisation, Year 2000, and the need for better information integration. There is also a trend to replace older customised systems with standard applications like an ERP system. The introduction of the Euro has not, as in other European countries, been a business driver in Sweden.

Where is the market heading? In an attempt to predict the near future market trend, we believe that there will be a short stagnation during the second half of 1999 until the second half of 2000. Companies that have not bought an ERP system before the second half of 1999 will not be able to go live before the millennium if the purpose is to make the companies IT environment Year 2000 reliable. After the millennium, companies will have to clean up before they have time to start looking at new solutions, which will make the market grow quickly again.

There are different opinions about the future ERP market. We believe that the market will continue to grow strongly after the millennium, but probably in a different way due to new market drivers. The Year 2000 conversion has driven the market the last couple of years. Hence, the reason for acquiring an ERP system has been mostly technical. According to our interviews, Year 2000 and obsolete customised systems have been the most important factors for changing to ERP.

After the millennium shift we believe that this technical point of view will change. The reason for acquiring an ERP system will turn towards a more strategic approach. The ERP clients we interviewed saw the strategic potential when they acquired the system, but they did not have time to fully benefit from the potentiality that the system offers. This is something the companies feel themselves. Some of them have projects for developing their use of the ERP system starting after the millennium. They have other things to deal with before Year 2000 and do not have time for business development right now.

The systems are getting better known and the awareness of their advantages and disadvantages is rising, especially among top management. We believe that potential ERP clients as a result will have another, more strategic, point of view. The ones that consider an ERP system will see it as a strategic opportunity to strengthen their competitiveness, an instrument to improve the company's process flows etc.

Since a substantial portion of the large companies already have an ERP system, the growth of new sales to this customer group will not increase in the same way as before. Instead, the sales of complementary modules, components, will increase, since most companies only have acquired the basic modules. Companies will acquire complementary modules or components, in order to increase the strategic use of the ERP system. ERP and third-party vendors are constantly offering new products in this area, for example Decision Support Systems.

The ERP market among small and middle-sized companies has not yet been as exploited as for the largest companies. The large ERP vendors are now heading for this customer group. In order to reach them, the ERP vendors have to offer simpler

solutions. Solutions that are cheaper, pre-configured and easy to install. One way of making the ERP systems more attractive to smaller companies is to sell them at a fixed price, with hardware and implementation included. Apart from fixed price, leasing of the whole ERP environment, where you pay a monthly fee, has also been discussed. Outsourcing of the IT environment is another possible outcome. It would be possible for a customer to connect to an ERP system, which is managed by an outsourcing partner. The large ERP clients have expressed that they primarily need help with the support of the system, but they are convinced that it is necessary for small and middle-sized companies to outsource the whole administration of the ERP environment.

It is likely that the Euro conversion will have great impact on the ERP market concerning small and middle-sized companies. Recent reports show that the smaller companies have not come very far in their work of being able to treat the new currency. This may therefore be a business driver for ERP sales to this customer group. To start with, this customer group will see the ERP solution as a technical change to be able to handle the Euro. When the Euro problem is over, they will like the large companies more and more focus on business development, with the help of the system.

6.2 The ERP consulting business

The ERP market has been a successful playground for the consulting firms. Their difficulty has been to find qualified employees. Lack of experienced people has gained much attention on the market. This is still a problem even if it is not as urgent as before. Since this problem is well known among the ERP clients, their most important factors when choosing an ERP business partner is reference projects and qualified people. The clients want to know exactly which people that the consulting firm will provide for their ERP project.

The consulting firms have received much criticism for delayed and expensive projects. One can often read that the risk increases with the size of the project, number of licences and modules. We have not, however, seen this connection. The most important factor for a project's success is instead the client's effort. If the client has the right expectations and knows what an ERP implementation requires, the project has a good opportunity to be successful. Other implementation success factors are; full-time dedication of appropriate resources; enough time and content of training; the ability to manage the change; the right level of business process re-engineering throughout the project; a well-defined scope, and keep to it.

What are the new services that the consulting firms will have to deliver to be competitive in the future?

- Management consulting skills
- Specific industry knowledge
- Euro knowledge
- E-business knowledge
- Outsourcing capabilities

6.2.1 Management consulting skills

As described earlier, the market around the basic ERP system will grow, especially among large clients. The focus will shift from software implementation to business development with the help of an ERP system. The ERP clients will see their ERP

acquisition as a more strategic solution than a technical one. Hence, the ERP consulting firms will need to be able to deliver management consulting services like business development if they want to work with the larger companies. It will be more important to be able to offer both IT and management services in the future. The consulting firms will probably choose different approaches here. The global consulting firms will work with mostly large international companies while smaller consulting firms will work with smaller companies that do not require management consulting services to the same extent. Those companies that have several years of management experience will have a competitive advantage.

6.2.2 Specific industry knowledge

The ERP vendors are dividing their systems into industry solutions and also want their consulting partners to concentrate upon a limited number of industries. This requires specific knowledge of the chosen industries, instead of vague knowledge of all industries. Here the global consulting firms have an advantage, because of the possibility to fly in industry experts from abroad.

6.2.3 Euro knowledge

Since the Euro probably will have large impact on the ERP market concerning future ERP clients, it can be a competitive advantage to have good knowledge of how to handle the new currency, both technically and strategically. The knowledge in this area is insufficient today. The market takes one thing at a time and today, Year 2000 is still dominating.

6.2.4 E-business knowledge

Internet-related business is rapidly growing as more and more companies get connected. ERP systems and the Internet will get a closer relation as companies start using e-commerce and e-business. Today, most companies use EDI when they communicate with their clients/vendors but with an Internet solution the connection becomes cheaper and simpler. Knowledge of ERP web-solutions may become a competitive factor on the future ERP market.

6.2.5 Outsourcing capabilities

ERP outsourcing is a service that everyone we interviewed believes will increase. One important factor is the lack of qualified people. ERP clients have difficulties in recruiting and keeping their ERP employees. Hence, many companies will have to outsource their ERP environment. This can be a very interesting service, with good growth opportunities.

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Tommy Wickström, Account Manager, SAP Svenska AB, 981029
Bo Lundblad, Sales Representative, Oracle Applications, 981105
Stefan Multing, Business Solution Manager, IFS, 981110
Björn Wetterling, Business Area Manager, IFS, 981110
Erik Philipsson, Product Manager, Scala International AB, 981112

Claes Granath, Marketing Director, Baan Company, 981117
Karin Samuelsson, Responsible market communications, Baan Company, 981117
Bengt Kallenberg, Marketing Manager, SAP Svenska AB, 981123
Rikard Frenkel, Alliance Manager, SAP Svenska AB, 981123
Mats Forsell, Business Product Manager Distribution, IBS Sverige AB, 981124
Jan Lindow, Information Manager, Intenia International, 981203

7.6.2 SAP clients

Berith Wärmé Johansson, SAP project manager, Kraft Freia Marabou, 981021
Jörgen Schön, IT director and SAP project manager, Goodyear Svenska AB, 981022
Harry Jokelainen, Lan Administrator, Goodyear Svenska AB, 981022
Anne-Charlotte Bråth, Division Manager, AB Pripps Bryggerier, 981026
Dag Åselius, IT director and SAP project manager, Tibnor, 981027
Gustav Båthe, IT director and SAP project manager, Henkel Barnängen, 981028
Gustav Nygondh, Director of information systems and administrative development, SJ, 981029
Ali Eskandari, IT director and SAP project manager, Arvid Nordquist, 981106
Jahn Karlsson, Director Business Applications and SAP project co-ordinator, AGA AB, 981116

7.6.3 SAP consulting partners

Magnus Järund, Business Area Manager, Resco AB, 981208
Henrik Philipsson, Manager, Andersen Consulting, 981222
Mats Hillblom, Business Area Manager SAP R/3, PriceWaterhouseCoopers, 990111
Per-Ola Niblaeus, Skill Center Manager ERP, Division Industry, Cap Gemini, 990128

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Tommy Sjöström, Sales Manager SAP R/3, Siemens Nixdorf, 990121
Wilgert Andersson, Business Area Manager SAP R/3, Mandator, 990121
Birgitta Larsson, Group Manager Business Integration, Enator, 990121
Göran Haner, Project Manager SAP Competence Center, Ericsson Data AB, 980122
Jan-Inge Månsson, Coordinator SAP R/3, Sema Group, 990122
Bernt-Ove Boerius, Business Area Manager SAP R/3, Deloitte & Touche, 990125
Björn Tellberg, Sales Representative Manager SAP, MAS Sverige, 990125
Tore Karlsson, Staff Manager, Frontec, 990125
Jörgen Nilsson, CEO, Capito Consulting Group, 990125
Thomas Nordgren, Nordic SAP-service Line Manager, Origin, 990129
Robert Horvath, Manager, Ernst & Young, 990201
Wårny Ekelius, Technical and Development Manager SAP, WM-data, 990201
Malin Anjou, Manager, KPMG Management Consulting, 990201

7.6.4 Various

Anders G. Nilsson, Professor of Informatics, Institute V at the Stockholm School of Economics, and the University of Karlstad, 981027
Ingemar Sjöberg, Consultant in Financial Systems, Cibol, 981104
Sören Janstål, Consultant in ERP systems, DPU, 981109
Filip Ekstrand, Division Manager, Data Webhouse, 981118

7.6.4.1 Telephone interviews

Bindi Bhullar, Analyst, GartnerGroup, 991115

Jan Dahlin, IT Director, SPP, 990202

Lennart Brindeberg, Project Manager Euro project, Telia Mobile, 990202

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Appendix

Appendix A - Possible ways to obtain primary information

Appendix B - Interview questions

Appendix C - Different types of outsourcing

Appendix A: Possible ways to obtain primary information

Primary information can be obtained in the following way:

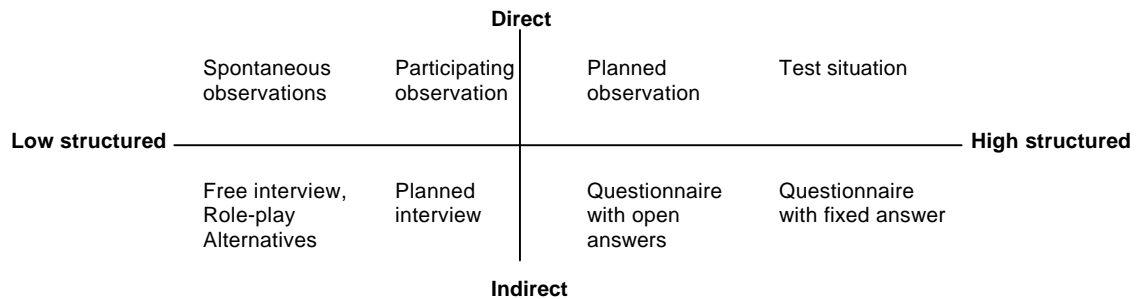


Figure A: Different ways to obtain primary information, Ekholm & Fransson (1992)

Direct information means that the investigator observes an event with his own eyes and ears. *Spontaneous observations* could for example be something a person sees outside his window, and this is not useful in research because he will probably not remember it long, and important factors can be missed. *Participating observation* is a useful method in discovering unexpected things, but it is time-consuming to participate in a company's business. When accomplishing a *planned observation* a time schedule is followed to make the information more reliable. It is possible to see how the observations have been made, and they have not been changed since they follow a strict schema. The problem with the method is that several observations are needed to receive a reliable result, which is time-consuming. A *test situation* is standardised, which means that the same conditions should exist for each observation, and the registration and the interpretation of the observations should be handled in a pre-decided way. The reliability is good, but it is hard to standardise a method where people are involved. Besides, this method is only useful for repetitive events.

Indirect information means that the investigator tries to find data by using another person's expertise. A *free interview* is useful when the interviewer needs information about a new domain. He only has a vague knowledge about what questions to ask, etc. *Role-play* is a useful method when oral descriptions are not enough. Things that people do not want to talk about can come up in a role-play. The *planned interview* is the best method when the questions are specific. The interviewer can use follow-up questions to the questions that he finds interesting. It is also possible to ask complex questions, and questions that the respondent finds irrelevant, since the interviewer can explain, specify and motivate them. But there is a risk, as for the free interview, to receive unwanted effects, and the pressure to answer can influence the respondent not to think through his answers. *Questionnaires* give the most neutral answering condition. Interview effects are avoided and the respondent is given time to answer the questions in his own speed. The use of questionnaires is useful when many respondents are required since it is not necessary to spend time with each of them.

Appendix B - Interview questions

Interview questions for ERP customers

Choice of ERP system

Describe your role in the implementation project

Why did you acquire an ERP system?

Which gains did you expect?

What requirements were did you have on the solution?

Who were involved in the decision making process for the ERP solution?

Were any external consultants involved?

How many systems did you take a closer look at?

Which were the most important reasons for choice of ERP system?

Choice of consulting firm

Who were involved in the partner evaluation?

Which were the most important factors for your choice of partner?

Had you hired this consulting partner before?

Was their solution specific in any way?

The implementation process

How many modules have you implemented?

How many people were involved in the process?

Internal/external?

Part-time/full-time?

What was made internally/externally?

Did you make any customisation/organisation changes?

How did you follow the project plan?

Going live

How was the final result?

Was the system fully implemented or were adjustments necessary?

Have your expectations been satisfied?

Does the support work satisfactory?

Have you had problems in finding/keeping qualified employees?

Any advises to other companies that are about to implement an ERP solution?

The future

Which trends do you see on the market?

Do you see any specific needs that you have for the future?

Have you thought about ERP outsourcing?

Are you going to use e-business and/or e-commerce?

Are you thinking of connecting you closer to your vendors and customers (Supply Chain Management)?

Interview questions for ERP consulting firms

Services

- Which requirements do a consulting firm have to meet?
- Are you specialised in specific industries?
- Are there any customer needs where the consulting firms have lack of knowledge?
- What are the most important factors for a successful implementation project?
- Do you provide ERP outsourcing?
- Should a customer adapt the organisation or the ERP system?

Market

- What are the advantages in being a global/local partner?
- What is the market trend of today?
- Which are your hardest competitors on the market?

Future

- Which trends do you see on the market?
- Will more management skills be needed for the consulting firms?
- Is the connection ERP-Internet going to grow?
- Do you see any future requirements for the consulting firms?
- Will you work with the smaller ERP customers as well?

Interview questions for ERP vendors

Market

- How big is your market share today?
- Which are your primary customers?
- Which are your hardest competitors?
- Is the Swedish market different from others?
- What are the advantages with your system?

Future

- Which trends do you see on the market?
- Where is the future potential?
- Is the connection ERP-Internet going to grow?
- Is outsourcing something for the future?
- Will you try to sell your systems to smaller companies, how?
- What do you think about componentisation?
- Do you see any threats to the market?
- Will smaller vendors survive on the market?

Appendix C- Different types of outsourcing

There are different types of IT outsourcing. We will describe a model first produced by A. Yakhlef and modified by Ina Ericson and Marica Frostblad in their candidate thesis.

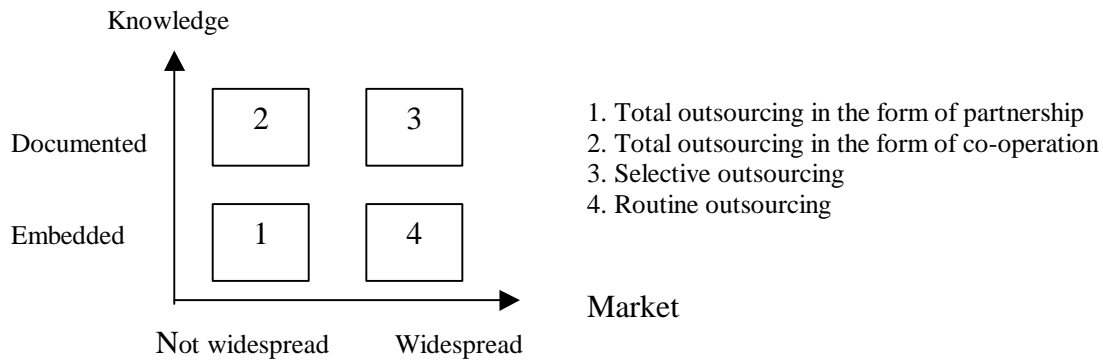


Figure C: Different types of outsourcing, Ericson & Frostblad (1997)

On the vertical axis is knowledge. Knowledge can be documented, available for everybody, or embedded, which means that the knowledge is in the minds of some people.

On the horizontal axis is market. Knowledge has a restricted widespread on the market when embedded in individuals or documented but organisation specific and not used outside the organisation. Knowledge, with a large widespread on the market, is mostly documented information, but the knowledge can also be an accepted fact and be without documentation.

Total outsourcing in the form of partnership

This type of outsourcing assumes that the knowledge is embedded in a few individuals, who are very familiar with the organisation's mechanisms. It involves special skills and knowledge that only concerns a few people. The embedded knowledge may be in professional skill and its strategic advantage is that it is difficult to transmit. To get hold of the embedded knowledge, the system and the relations in which the knowledge is embedded must be available.

Total outsourcing in the form of co-operation

This type of outsourcing is a co-operation where the customer and the vendor work together for a special purpose. The difference from partnership is that the customer wants to be more independent from its vendor. Companies that use this form of outsourcing are anxious about their data security.

Selective outsourcing

Selective outsourcing means that you outsource one or several parts of the IT activity. The knowledge is widespread and is available for people within and outside the

organisation. This knowledge can be attained easily from many competitors on the market. This type of outsourcing is used because the IT duty is more cost effective if performed outside the organisation.

Routine outsourcing

Some IT services are not documented but so widespread that they have been an accepted fact. These services are simple and can be performed by many IT consultants.