B6548: ENTERPRISE SYSTEMS

Case Analysis Report

"Why ERP? A Primer on SAP Implementation"

Ashish Garg

Dhiraj Gajeelee

Gabriel Rüeck

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1   INTRODUCTION

1.1   Company History and Background

McDougle Furniture was a family owned business which the family had been operating for many generations. The company was located in North Carolina which helped it to take advantage of high quality hard woods and labour in the area. The company products, primarily wood products and furniture, were known for their high quality and had won many awards for the design, innovation and style. Most of the products were custom products, mostly for the domestic market. The company was managing demand by constantly improving of their furniture and regulating the number of customers. While the company was known for its exclusive works, it was also humane in its policy of not laying off employees. The work force was highly skilled and the work place environment was very informal where employees were helping each other out when there was a problem. The trade-off was slow growth of business.

The company had Materials requirements planning (MRP) system to manage the production process. It schedules the procurement and production of all the required materials for fulfilling the customer's orders. Any changes in customer's preferences would be incorporated in the Bills of Materials. The software could meet most of the requirements of the manufacturing processes.

There was a usual tussle between manufacturing and marketing functions. This was essentially, because of conflicting nature of priorities set by the respective functions. On one hand, marketing function was more tolerant of the fickle nature of customers' choices and tried to accommodate them, production persons would try and resist the changes as some of the items had long lead times and capacity planning would get disturbed.

1.2   Reasons for an ERP System

One of the examples of such a tussle was a desk for an Atlanta Lawyer. The order was worth US$20,000. The customer wanted some last minute changes. Because of the changes, the shipment of the desk was delayed. When it was finally shipped, the entry was not made in the sales books while it was there in the production books. When the customer rang up, there was confusion as the Sales Manager was not aware of the status of the shipment.

This situation could have been avoided by ERP implementation. With SAP in place, as soon as the production process is over and the shipment is packed and shipped, the system automatically updates the inventory balances and makes appropriate journal entry. So, when the customer enquires about the status of the product, the Sales Manager can find out about it just by keying in the customer order number.

The ERP systems help in increasing the efficiencies and productivity through integration of information and processes across the entire firm. It provides an integrated software tool, which combines all the systems in organization from *Human Resources* and *Financial Accounting* to the *Manufacturing* and the *Procurement Process*. It has a number of so-called *Best Practices* built in and so the company can directly adopt those practices. It also supports the supports the operations of multiple international sites and the global sourcing and supply of material. The systems of ERP contain data about the individual legal systems which are unique to each country. The systems of ERP can improve the company's performance by improving the customer order processing, reducing the lead times, reducing the data entry mistakes, stream-lining the manufacturing processes by identifying the products to be manufactured first and by generating the *Bills of Material*, managing inventories etc. They also keep track of credit limits of customers and generate aging schemes of accounts receivables, thus avoiding delays in payments. ERP systems also contribute to avoid the duplication in work in various functions. Thus they provide benefits in all areas of business operations. Besides the above mentioned efficiency and productivity improvements, ERP implementation becomes a competitive disadvantage in some of the sectors, if not implemented. Some of the customers require their suppliers to have ERP systems implemented.

On a more specific basis, Mr. McDougle wanted to purchase Ohio plant which was owned by his brother. Ohio plant had ERP implemented there. Mr. McDougle would like to integrate the businesses processes of the two plants.

2   INSIGHTS FROM A SAP TRAINING

2.1   Characteristics and Capabilities of SAP R/3

SAP R/3 is a version of SAP which stands for *Systems, Applications and Products* in data processing. It integrates the information throughout the company through single data entry, immediate access and common data base. All the processes are integrated with same data.

Data are updated in real time and changes are immediately effected and made available to everyone else using the system. SAP R/3 is entirely built around *business processes*. These processes cut across the functional areas and integrate all the functions. The way the functions are integrated is depicted in **Figure 1**. The main aim is to improve the efficiency and productivity of the organization by eliminating duplication of information, eliminating multiple forecasts, multiple entries and the resulting errors.

The main capability of SAP R/3 is the management of *resources*. Resources include the *employees*, *materials*, *supplies*, *buildings*, *infrastructure* etc. SAP R/3 is able to adapt the changes required based on past trends and the future requirements. Another important feature is the preparation of the system for global operations. The software is ideally suited to companies which either operate internationally or source or sell products in an international environment. SAP also takes care of the local accounting practices, regulations and tax requirements and the necessary currency conversions.

Figure 1: Integration of Functions in SAP
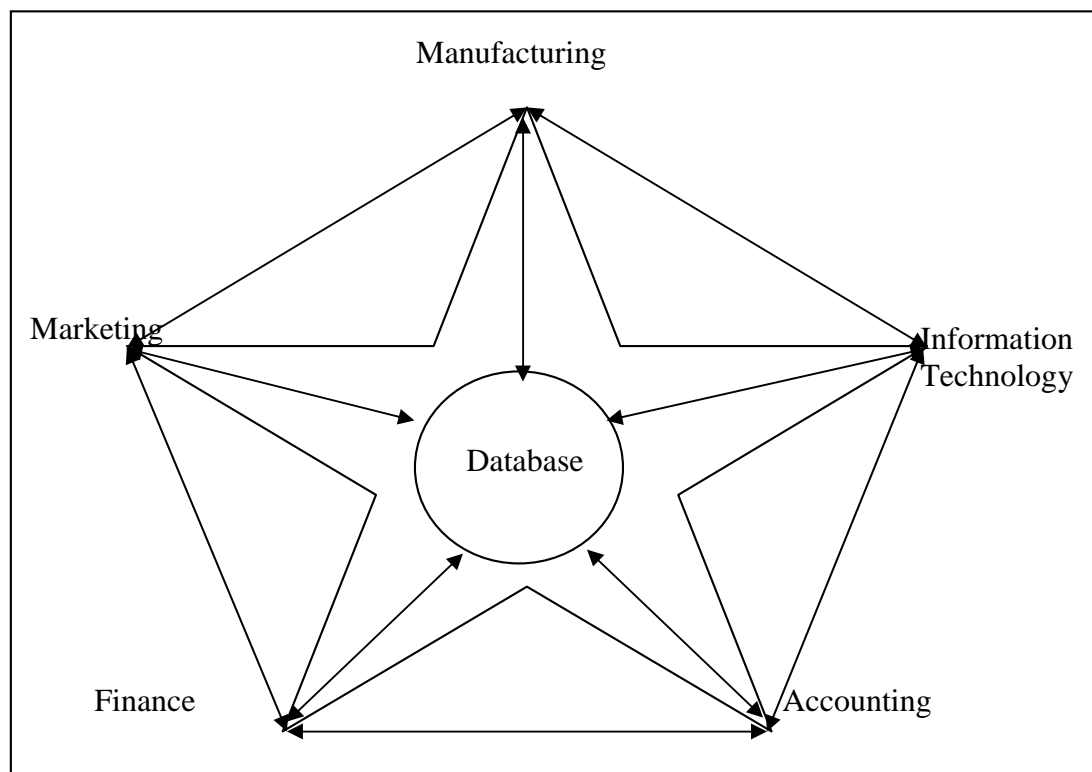
The SAP R/3 system can be applied to all kinds of organizations. Some of these business processes are very generic in nature and have to be performed in any businesses. The term organizational element is used to describe the things in the company and uses codes for them.

Organizational areas are divided into Sales areas, Control areas and Business areas. Finally there is a Client, which the highest level of integration of these three areas. For individual companies, these standard businesses processes have to be adopted. This may at times entail business process re-engineering in the companies where the system is implemented. In summary, ERP system helps organizations in replacing the disparate legacy systems and in removing the inefficiencies arising from the use of disparate data and applications. This is done by providing integrated applications which access the standardized enterprise data.

2.2   An example of Demo

The demo used in the training session described a customer order processing cycle in a motorcycle company, where a typical cycle would start with customer service representative receiving an order from a retail dealer. The role of R/3 system starts directly with the mode of the incoming order, which can be by fax, EDI or internet. R/3 would check other material management for availability and find about the possible delivery date so that the customer service representative could tell the dealer about the possible date of delivery. In case it is not available, it would generate the bills of materials, taking care of the production processes, lead times and would come up with a possible date by which the item would be produced. The system would also check if partial delivery was possible.

During the sales order taking, the representative can check the customer credit limit and update the cash forecasts to reflect the sales. The R/3 system can then automatically update the production data. The advantages here are that the customer can be informed about the exact date of delivery; taking into account prioritizations in the production process and the credit worthiness of the customer. SAP R/3 can also derive the probability of a sale from an inquiry of a customer based on past statistical data.

Once the material is available, it is ready to be picked up, packed and shipped to the customer. Special packing materials also have to be available for this purpose. During time of goods issue, the system automatically generates a goods issue document to account for the outgoing inventory. The goods issue date enables the accounting department to relate the movement of goods to the invoice.

2.3   Some implementation realities

Some of the implementation realities can be listed as under:

SAP software costs for ASAP at the basic level would be US$1 to 2 million. Training and
consulting fees are in a similar range. Then there would be annual licensing fees
typically 15% of the initial cost.

If some custom programming is required, costs can be much higher.

The consultant implementing the software has to be really good in understanding the program
as well as well versed in the industry to be able to understand the processes and help to
integrate them.

The SAP business process reference models cannot be changed. So the organizations which
are implementing SAP R/3 have to modify their business processes to match them with
the reference models. ABAP/4 allows the generation of special processes which are not
covered within the standard programs. But SAP recommends not making any major
changes to the system, as the changes made may not be compatible with the future
versions of software.

A change in business processes changes the nature of jobs in some cases. People find it hard
to adjust to the new working environment and they may lose morale or even quit.

There is a lot of work involved in the implementation down to the very single details. These
details are very important as they provide the companies with the options and flexibilities.

The total implementation time may vary between six and nine months.

The project team should comprise of representatives from various functions. These individual
members should be well conversant of their function and their company.

Wrong expectations are one of the major reasons for disappointments. According to studies
done, only 10% of the implementations succeed with full functionality. Cost overruns
exceed 178%, and schedules overrun average 230%. Implementation reality averages
41% of what is desired. 35% of the ERP implementations are cancelled in between. Of
the implemented ERPs, 51% consider the ERP implementation as unsuccessful with only
34% being very satisfied.

Figure 2: ERP Implementation Realities

	Planned	Actual
Cost	100	~275
Schedules	100	~330
Functionality	100	~40
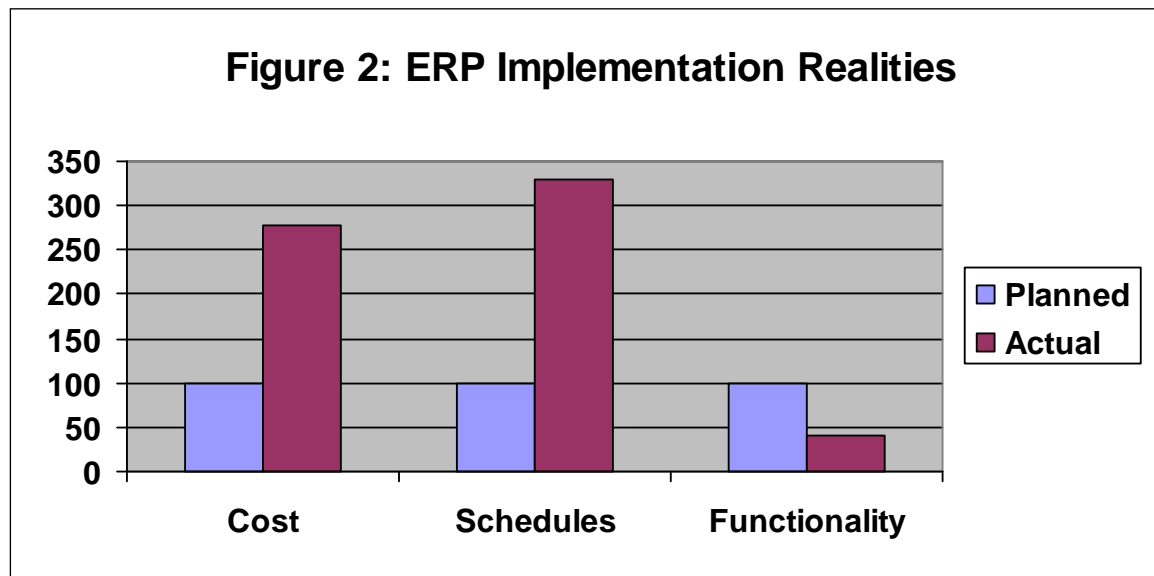
2.4   Issues to be raised

The following issues are to be raised while mulling over the decision of implementing the SAP R/3.

1. SAP R/3 had been developed by a German firm, where the business environment and culture is different from that in USA. In continental Europe, enterprise structures are more centralized, as compared to the USA. Hence, cultural differences may arise.

2. SAP R/3 would entail lot of changes to the business processes. While they may eventually lead to benefit to the organization but the whole process of change is very painful and lengthy. It would require lot of understanding from both the management and the employees for implementation of SAP.

3. The way customers are treated can be quite different from enterprise to enterprise. At McDougle's, last minute wishes of customers were accommodated, leading to different product looks or features. However, with SAP in place, it would not be possible to change the bills of materials once the production of product has started. One of the critical success factors for the company was the flexibility which clearly would be lost after SAP implementation.

4. Another issue is cost. The installation of SAP requires large investments, not only because of the system software itself, but also due to the required training, the necessary change in processes and the enterprise culture.

5. The right consultant has to be found for the implementation project.

6. SAP forces a culture based on best practices which are very formal and standardized practices. These may not go well with the present culture at the McDougle Furniture Company. There are other issues like whether the company has prior experience with formal information systems or whether it has the required discipline and training capabilities to develop people for R/3.

7. In case the company McDougle Furniture decides to implement it partially, issue would be whether it would be compatible with the existing system of MRP which is being used in the company.

8. Quality of Data input is very important. If there is a bad quality data input to ERP, it can be disastrous for the company. It can be much worse to have a bad data entry in a firm with an ERP system than in a firm without an ERP system.

9. The company has to devote the best and the brightest manpower in ERP implementation. This is because the software is complex and crucial for business. Also practically, it has been observed that the companies cannot send back the implementation teams back to the previous business as there are so many things to do after implementation.

3 TWO DIFFERENT PLANTS: OHIO AND NORTH CAROLINA

3.1 Business strategies, Markets, and Products

The business strategies in Ohio and North Carolina plants were entirely different. The products in North Carolina plants were very special, customised to individual customer's requirements. Since it specialised in custom products, it would pamper the customers by accommodating each improvisations proposed by the customers and therefore would make many changes in their designs. The production rate was very low. This was a different case in Ohio, where there were standard products, standard customers with product lines changing very slowly. The production volume was very high as compared to North Carolina plant. In fact NC plant did not expand as part of their strategy which was not in favour of laying off its work force.

The above difference was sufficient to mark the difference in strategies and production processes. Since Ohio plant had standardised products, so very less inventory was required.

The forecasting was done by customers, who used to inform of the requirements and the plant would then produce to requirements. This would result in shorter lead times from production to dispatch. In NC plant, the forecasting was done by both Sales and production departments, bills of materials was generated through MRP, the products were custom, and the inventory was high. There was a wide range of customers and the company's designers would work with individual customers.

3.2 Production Processes

On the supply side, raw materials in Ohio plant had been standardised and as far as possible, they would require their suppliers to cut the wood to pre-finished standard sizes and shapes. So the production process would be more efficient. The inventory would also reduce for this reason. They also had a very close relationship with their suppliers and some of them would actually manage the inventory for the plant. For hardware supplies also, the estimate for various sales and product mix would be made. In NC plant, the situation was different and plant was full with raw material inventory.

Another difference was in packing, which was done in cardboards and very professionally in Ohio plant while it was done in rolling blankets in NC plant. The assembling of finished products in Ohio plant was done in stores while assembled furniture items were shipped from NC plant.

3.3 Business Processes

Other business processes like accounting were also different. With most of the suppliers of OH plant, there was no paper work and accounts payable. This was in contrast to the NC plant where the accountants used to worry about the aging of accounts payable and the reconciliation. The same conditions were valid on the sales side.

3.4 Organisational Culture, Management Style, and Change Readiness

The culture of the two plants was also different. To start with the office at OH was very Spartan as compared to the NC plant office. The NC plant had very relaxed and informal working environment. They invested a lot in employees training and would prefer sticking with their work force. People would help each other in case of problem. The recruitment was more on the basis of the feel of furniture business in the summer interns. The OH plant would more emphasise on the discipline, carefulness in the work habits and reliability on the job.

The employee turnover was high. Recruitment was through adverts in newspapers. The wages were low.

The workers in NC plant were very flexible. There was a lot of cooperation between the workers. However, there was a resistance to change which stemmed from the insecurity relating to their jobs.

3.5   Technology

NC was using MRP while the OH plant was using SAP R/3. Besides this there were several other differences in technology deployment. OH plant was highly automated with roller conveyors for moving the materials and few workers. There were also computer controlled machines which would help in reducing the setup times. In production processes, a paper would travel with the units which were generated by the systems. That paper has some information about the products. Using R/3, there was hardly any paper used in dealing with the suppliers or customers. For example, the customers would simply read the bar codes after receiving the products and then transfer funds to the account covering the material that they received. The hardware cost estimation spreadsheets were linked to the SAP R/3. Most of the communication with the suppliers and customers was through EDI connections. There are data traps and filters which would identify which information, plans and orders were reasonable or not.

In contrast, there was a lot of interaction with customer and suppliers in NC plant which was either through personal meetings or through fax or telephones. There was an MRP system for planning but was not used very effectively. Most of the time, the bills of materials would change many times during production of a single item.

4   MR. MCDOUGLE'S OBJECTIVE

Mr. McDougle was trying to implement SAP for operational ease. His brother was about to retire and Mr. McDougle was about to purchase the plant. That plant in OH was using SAP R/3. It had much better efficiency and productivity. Mr. McDougle thought that if he implemented SAP, it would be easier to integrate the functions of the two companies. That was the prime motive of SAP implementation.

5   DAN BRAGG'S OBJECTIVE

Dan Bragg wants to copy the configuration of SAP R/3 from the Ohio plant to the North Carolina plant, doing only minor modifications. The successful and quick implementation of SAP R/3 at the Ohio plant makes him think that this can be repeated in North Carolina, too. He even thinks of establishing a kind of a record in terms of implementation time, maybe party caused by personal ambitions to profile himself as expert in SAP R/3. He does not or does not want to realize that the plant in North Carolina has very different processes and order handling from the Ohio plant.

6   BILLY'S IDEAS ABOUT SAP AT THE NORTH CAROLINA PLANT

After having undergone the SAP R/3 training and spoken with different managers at the Ohio plant and at other plants, Billy thinks that SAP R/3 may be beneficial for some applications like accounting, where processes do not deviate so much from the Ohio plant and where processes are anyway mostly standardized. But Billy definitively feels that SAP R/3 should not be implemented in the production process and that the plant in North Carolina should keep its existing MRP system for production. He thinks that SAP R/3 is more suitable for standardized processes in which a flow of homogeneous products are processed but that SAP R/3 is not so suitable for their own products which are mostly unique furniture parts and which have numerous change requests even after their production has started.

7   BILLY'S OBJECTIVE IN AN SAP IMPLEMENTATION

Billy's objective is to consolidate the accounting data between the plants in North Carolina and Ohio because that also was what Mr. McDougle had mentioned as an objective right from the beginning. He thinks that SAP R/3 could be beneficial for that purpose and therefore proposes an implementation of the accounting modules only. Since he does not want to re-organize the production process completely from scratch, he does not favour a SAP R/3 implementation in the production process where he fears that this would hardly be possible due to the nature of their business.

8   REASONS FOR THE SUCCESS AT THE OHIO PLANT

Several factors contributed to the success of the SAP R/3 implementation in Ohio. The Ohio factory exclusively builds homogenous standard ware and does not engage in individual items. This enables the Ohio plant to run a streamlined operation that can be very well

modelled with SAP R/3. In their manufacturing operation, they receive pre-processed parts and mount these parts together to furniture parts which are then sold to big markets. This operation does not involve any changes in the material processing once a certain line of product has been released. All that has be done is to get the sales demand into the system and schedule the production. The bill of material which is placed in SAP R/3 then generates the purchasing order and the raw material can be delivered to the plant in time. In fact, the Ohio plant even uses a Just in Time approach for this. Very important for the streamlined operation is that once the production process has started and is running continuously, there are no more changes to the product. Since the few suppliers and customers of the Ohio plant already use SAP R/3 systems in their operations. Therefore, it was easily possible to connect the SAP R/3 system of the Ohio plant with the systems of the suppliers and customers so that the ordering process can be automated.

Due to the streamlined production process, it was easy to implement SAP in the accelerated approach ASAP without any big modifications of SAP R/3. The amount of changes in the processes that had to be done at the Ohio plant still was a manageable amount of work.

The people at the Ohio plant also received a lot of help from their suppliers and customers, who had faced implementation issues in similar environments themselves, and so most of the issues, could be resolved quickly, and the implementation turned out to be successful.

9   COMPANIES WHERE SAP R/3 COULD BE SUCCESSFUL

The introduction of an enterprise system as SAP R/3 has been successful in many organizations regardless of the nature of the business. This has been so owing to universal functions of many of the modules in the SAP R/3. We have identified the benefits which the organization will yield from this implementation.

Such a system will be successful in organisations which have multiple locations of operations. Multinational companies are the most likely winners in the implementation of an enterprise resource planning system such as SAP R/3. Owing to the multiple locations it is more difficult to manage the resources efficiently. SAP R/3 also takes into account the multilingual differences. One example of the success of SAP R/3 in managing resources around the globe is the case of Nestlé. Nestlé Nordic did implement the mySAP CRM and this proves to be a success for the whole organization and this resulted into cost cutting. Their customer relationship management was more efficient and with less resource as all data were

centralized. The management of the company could have accessed to the information quickly. The user can swap between languages depending on the country of operations. Another example is the case of the Italian Brewer Birra Perroni which also implemented a new centralized customer department starting the sales order entry to the delivery process. Perroni was able to measure the company performance, achieve better deliveries across Italy. Since the system is able to consolidate financial data from different locations/countries and in different currencies, this helps it to be success among MNCs. With such a system, the organisation can monitor on a real time basis the actual performance of the organisation with budgeted figures.

Timeliness of information, real time data and flexibility are the crucial factors in most industries and especially in the airline industry. Technology is, in fact, one of the main drivers of the airline industry in making the industry more efficient and flexible. On top of the above, the company also benefits from the advantage of an integrated system which is better management of the resources. One example of the implementation in the airline industry is the SAP R/3 implementation in Air Transat, the Canadian Charter Airline. Over-capacity, increased fuel and aircraft maintenance costs, diminishing profit margins, fierce competition and an overall threat of economic failure were the few problems which the company was facing before implementing an enterprise system. SAP R/3 reduced the number of operational systems and the fully integrated system allowed an access to real time information and also allowed a large volume of information to be managed at any time. The integration of the system also enabled better management of all earnings and expenses and improved decision making process. Thus, the cost effectiveness of each route was more transparent. Savings of the company for a year was estimated to be around CDN$3 million.

10   COMPANIES WHERE SAP R/3 MIGHT NOT BE SUCCESSFUL

We have highlighted, so far, many benefits of SAP R/3 and also mentioned some success stories of this ERP system. However, the percentage of failure of SAP R/3 is high. Many reasons are associated to this failure. Nevertheless, our focus in this section will be on the companies where SAP R/3 is not appropriate.

Owing to the high cost of implementation, the introduction of SAP R/3 is not appropriate in companies with low turnover and low profitability. This will only stressed the financial situation of the companies. Most of the success stories concern the Multinational companies

where the turnover is high and they are highly profitable. In small businesses, although such implementation can bring in competitive advantage, it is not feasible.

For some companies manufacturing customized products, ERP systems like SAP R/3 are not appropriate. Since no planning can really be made owing to the fact that the organisation are producing on order, most modules of SAP R/3 cannot be implemented successfully. Modules like FI are quite generic for all organisations but other modules related more to manufacturing may not be implemented successfully. They may not provide the flexibility required for these companies. Taking the case in Why ERP we found that the products of the Ohio and North Carolina plants are not the same. One is in mass production while the other manufactures customized products.

The implementation of SAP is not encouraging when we looked at the statistics. According to the Standish Group, which is known for its high quality, independent primary research and analysis on IT and management issues, 35% of the ERP implementations are cancelled, 55% overrun their budgets and less than 10% of them finished on time and under budget. On an average, the cost of the implementation is 178% above the budget.

11 WHAT BILLY COULD HAVE DONE DIFFERENTLY

Since the introduction of an ERP system is not a simple IT system but more a reengineering of the business process, its implementation should be done in a very structured way. Billy should have undergone different steps before recommending the implementation of the ERP. Below is a list of the recommended steps out of which Billy had performed only a few.

1. To purchase and implement a ERP system, a feasibility study

    The company should carry a feasibility study before taking the decision to purchase an ERP system. Firstly, the company should be clear of the objectives of the organisation, Secondly the company should have a strong financial situation to be able to meet all the costs associated to the implementation of the ERP system. A cost and benefits analysis will show if the company will be better off with the new system. Since the system is not only an IT system but more a business reengineering process, the management and the employees of the company should be agreeable to its implementation to make it a success.

2. Criteria for selection of software

Once the decision to purchase an ERP system is made, one of the systems should be chosen. A few of them are available on the market and in order to decide about the one which is more appropriate for the company, management should look at the following criteria:

    a) Cost

    b) Reputations

    c) Reference

    d) Support and availability of skill resource

    e) Possibility of bankruptcy of vendor

3. Implementation approach

Management with the support of both the IT department and the ERP consultants should decide whether to scrap the legacy systems at one go or do it on a progressive basis: incremental or big bang.

4. Organization structure and project team assignment

One of the main factors which contributed to the failures of implementation of an ERP system is the lack of commitment of the people involved. In order to achieve this, all the employees, from top management to the lowest position, should be involved in the implementation process. The committees can be categorised as follows:

    a) Main project committee

    b) Sub-Project leaders

    c) Super user

    d) Planning and implementation team

5. Timeline for each part of the implementation process

A time schedule should be set in order to plan the implementation of the ERP. However, the timeline should neither be too rigid nor too flexible. A reasonable balance should be strike. Most ERP implementations take much more time planned.

6. Training and help desk

Training also contributes to the success of the implementation. Without properly educating the employees, the whole implementation can become a failure. ERP consultants should trained in-house trainers. Help desk is also during the implementation process and also after the introduction of ERP.

7. Regular review of the business processes

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