

ERP Systems

Group # 5 Written Report

HTM 304 – Section 03

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ERP (enterprise resource planning) is a concept that integrates and automates many of the business practices associated with the operations, production and distribution aspects of a company. It can incorporate several software applications that are brought together under a single, integrated service, which allows departments to interact more efficiently and business functions to be streamlined. It can also transcend a business' internal environment to incorporate systems of partners and suppliers to include additional functions like supply chain management. ERP systems can be a vital management information systems component, and often it is considered a business' largest information technology investment.

Enterprise resource planning began when companies built an application for a specific business process. Vendors of these applications then started to build more applications for other processes. When there were independent functioning applications for all business processes, vendors combined them into a suite of products and called them ERP solutions. ERP solutions now integrate information systems that cover enormous functionality (Kroenke, 2007).

An outgrowth of MRP II, enterprise resource planning is a cross-functional information system that directs activities within an organization. It is an internal system that replaces existing systems. The most common users of ERP systems are manufacturing companies because it includes the planning of materials, personnel, machinery, and inventory. The number of businesses that are looking to implement the system is growing because the functions can cover more activities like orders, as well as sales and marketing, and customer service activities (Kroenke, 2007).

ERP takes a process view of the entire organization and collects it into a single system in a central database. Software is used to manage all the organization's data and processes. ERP systems can be extremely vital in impacting a business' ability to increase production, integrate departments, and reduce costs. The organization must adapt to the ERP model, called the process blueprint, which is composed of diagrams, symbols, and documents that manage the applications and processes. It is important that organizations adopt and follow the blueprint correctly in order for it to work effectively. Adding procedures to the model can be very costly (Kroenke, 2007).

There are many ERP systems in a wide range of company sizes, but they all have small differences. Most of them focus on the most important segment of the organization. For a big company with multiple sites, every segment is important. They would need an ERP with full functionality, such as a commercial ERP. Such a system is extremely costly and is hard to modify. An organization can license a product called SAP R/3 from a SAP, a vendor, which can provide hundreds of diagrams in a model. Such a complex model is a big investment but might be worth it for a company who plans to deploy the system over a long period (Alleman, 2006).

Other organizations might implement a middle of the road ERP system. They may need only the core ERP modules and a few from SAP R/3. Even though a system change may be significant, a company may not be willing to invest as much into it if they don't plan to have it for an extended time. The company instead might look to implement an enterprise application integration which also solves the problem of

isolated systems; however, there is no centralized database. Enterprise application integration can be used as a stepping stone to later convert to ERP (Alleman, 2006).

Then there are small businesses with few employees and with one location. They may implement the least ambitious ERP system with the core functions: an ERP system without the BPR approach. Expected investment may be as little or less than 1 million dollars. They might also consider an open source ERP. It is free, and the procedures, training is very easy and the company relies very little on the vendor for help. This option is best when the company doesn't have much to lose, and the business can go uninterrupted if there's a problem with the system (Alleman, 2006).

Commercial and open source ERPs differ in price, flexibility, duration of implementation, training, and security. An open source ERP may be more attractive because it's easy to use, provides more flexibility for modification, and takes less to implement. Results can be seen faster, training and learning is easier, and it may be safer because security issues will be noticed quicker and can be fixed quicker. The downside is that it's only intended for small businesses, and the failure rate is higher (What distinguishes an Open Source ERP from a commercial one?, 2006).

Which ERP system is adopted also depends on the type of company. For example, production, distribution, and supplying companies will not have the same system. Production companies need an ERP system that focuses on the control of its resources in order to manufacture efficiently. A distribution company's main focus will be on the transportation of its products, and supply companies concentrate on

businesses processes and services. There are also many companies that focus on all three enterprise resource planning characteristics. The more complicated the system, the more expensive it is. Companies can have their ERP system custom made or buy it from commercial developers (Bool, 2006).

Selecting the ERP software is very important and can be a timely process. Businesses committed to install must have a backup plan in case of failure. The software should accommodate the blueprint model sketched and help achieve its goals. Price and flexibility also play an important role. Also, vendors define terms differently to make their product advantageously. Consultants play useful roles as well because they work with the business to determine their needs and help select the best system to meet their objectives. They also work with users since they will serve in the instrumental role of using the system on a daily basis. After the system has been implemented, another firm may be hired to train the employees (Kimberling, 2006).

After the blueprint with the underlying data has been made, the company sends a request for proposal to the ERP vendors of their choice. After the vendors have reviewed the model, they send a proposed solution back to the business. The business evaluates the solutions and prices of the vendors before making their decision (How to Select an ERP System, 2006). Vendors are not always the best choice to implement the system. After the ERP system has been chosen the company may hire a consultant or IT team to install the system. It may actually save them money, and they could also help manage and train the employees (Kimberling, 2006).

There are a number of popular proprietary ERP software applications that can aid in ERP implementation such as SAP, Oracle, PeopleSoft, Invensys, and Microsoft. SAP was the first to implement the IS category and has been around for 30 years. SAP is the leader in ERP software and continues to grow at a 12% market growth. SAP offers four solutions that cover different sectors: financials, human capital management, operations, and corporate services. Unlike manufacturers that mainly use MRP and MRP II, any industry can adopt an ERP system. SAP claims to reduce IT complexity while increasing business flexibility. It's a tightly integrated system that optimizes the cross-functional business. The infrastructure is very complex but can be modified in many different ways. It is a good option for a business that supports international operations. SAP licenses a suite called SAP R/3, which is highly customizable because it has its own programming language. It is comprised of a server that contains the software and database. The system can support an unlimited number of servers making it ideal for business growth. It can also support other databases including Oracle and Microsoft. SAP has become a leader in ERP based on the success stories that well known companies have claimed, such as Goodyear, Wells Fargo, Hewlett Packard and Dow Corning to name a few (SAP ERP: A Trusted Foundation for Business Excellence and Innovation, 2007).

Oracle is another leader in information software. Oracle also offers solutions to every sector. Their applications are fueled by their database technology, which they claim is very powerful to ensure that databases run quickly and efficiently. An advantage Oracle's E-Business Suite offers is that the company chooses whether to implement one module at a time or the whole suite, giving businesses the chance to

adapt (Oracle E-Business Suite, 2007). PeopleSoft and Oracle merged in order to grab a bigger market share. PeopleSoft's main focus was to make critical information available to the right people at the right time. It's chosen by companies that have a high regard for human resource operations (Oracle E-Business Suite, 2007).

Microsoft focuses on the users and takes a liberal stand when it comes to its competitors. It is most popular with small and medium enterprises. Microsoft constantly updates its products to be more compatible with users. While its market share may be small, its new innovations make them more recognizable as an ERP supplier. The biggest advantage Microsoft holds is that the software is fully compatible with its other applications and platforms (Knowing More on ERP, 2006).

Vendor's products continue to change and upgrade. ERP vendors are developing a new type of system called ERP II that was created due to the failures of businesses who implemented ERP. The new version is supposed to solve some problems of ERP such as including more intensive and extensive coverage, offering software to every industry and every sector, including more applications that involve external processes, and making it more internet friendly. Whether this will replace current ERP remains to be seen. It may have already replaced it, and there is no need to change the name because vendors are always making improvements to their products (What Are the Major Differences Between ERP II and ERP?, 2006). As every vendor aims to be the best, they will release products similar to their competitors that function and look alike. Soon, ERP will become a commodity in every information system that each suite will be hardly distinguishable from others (Kroenke, 2007). A

company has to be, though, that the software it buys as user friendly as possible. A company can have the best hardware in the world, but it has to remember that the software is the medium between employees and the ERP system. If employees cannot successfully establish a connection between the software and themselves, it will be hard for the company to retain a successful ERP.

There are several advantages for companies to implement an ERP system. Two of the obvious advantages are improvement of business performances and fixing business problems. An ERP system helps companies by improving the process of how companies take customer orders and process the orders into invoices and revenue. This procedure is known as the order fulfillment process. ERP is often referred to as back office software because it does not handle the upfront selling process. However, this might not be the case any longer because there are ERP developers who are currently developing CRM add-on software for ERP to do upfront selling. The ERP system is suppose to automatically guide the customer through the ordering process. Once the customer completes the order, ERP is supposed to send the information through different departments in the company to complete the order. If no problem occurs in the company, the process should be complete relatively quickly. Using the ERP system, a company can see all the information about the customer, which includes heir credit rating, ordering history, and inventory level. The ERP system can also track the customer's order if the company wants to know where the order is located.

Having the ERP system can help fix many business problems that arise regarding financial information, customer order information, the manufacturing process,

a company's inventory level, and human resource information. First of all, ERP provides reliable financial information by integrating the information from the finance department and the sale department. By doing so, the chief executive officer can evaluate the overall performance of the company as a whole.

Secondly, an enterprise resource planning system fixes the problem of having order information spread out in different software systems. By installing ERP, the company can track order information from the time the customer orders the product until the time the customer service representative enters the order and it is ready for shipment. An ERP system provides a single system that can help aid communication within the company. It helps the company keep track an order, coordinate manufacturing, and ship at the same time in different location.

A third example of ERP aiding and fixing a business process is when a manufacturing company with multiple units uses ERP to speed up the manufacturing process. Companies with multiple units usually have multiple systems for automating the manufacturing process. By implementing ERP, the company can integrate different manufacturing systems into a single, streamlined system. This can save a company an enormous amount of time and increase productivity.

The ERP system can also help reduce inventory for the company. The manufacturing process flows, and the company has a better view of order completion. Therefore, the company doesn't have to order more materials or stock large volume of inventory to make. This leads to better planning of deliveries to customers and reduces

the volume of goods at the dock and warehouse. The system also improves the flow of the supply chain if the company uses supply chain software.

The last problem an enterprise resource planning system can fix usage of human resource information. This is especially useful if companies have multiple business units. The company might have a problem tracking employees' clock in time or communicate with them, and using ERP can simplify the whole process.

There are several concerns that arise when companies want to install ERP systems. Some of the concerns are the time it takes to install the system, whether the system will fit into the way the company does business, the cost of the system, and its reliability. According to ERP vendors, an ERP system takes about three to six months on average to set up. However, this is not necessarily true for all companies. This may be true when the company is small, only a small area of the company needs the system or only part of the system is needed to set up. When dealing with a medium-size or large organization, the actual time it takes to set up the system is much longer than what the vendor states. According to several online sources, six months is the shortest time for an ERP system to finish set up with limited capabilities. To have a fully functional system, it usually takes the company about one to three years.

Before buying or installing an ERP system, the company needs to find out if the system is compatible with the way it operates. If the system is not consistent with how the company operates, the company can either withdraw from the plan or pick one of two choices. First, the company can change the way they operate to fit into the system.

This will be difficult if the company has operated in the same way for a long time. Secondly, the company can modify the software to fit the operation process. The downsides of modifying the system are the system requires longer time to setup, it may introduce bugs into the system, and it will be difficult to upgrade the system because modified systems have to be taken apart and rewritten to fit the new version.

Because of the cost of implementation, it is frequently done in incremental stages. An ERP implementation in an organization can cost millions of dollars to create and may take several years to complete. According to a study by Meta Group, the cost for small, medium, or large companies ranges from \$400,000 up to \$3,000,000. These costs include hardware, software, staffing, professional services, maintenance, and upgrading. Beside the costs of the installation and equipment, there are also various hidden costs, which include training, integration and testing, customization, data conversion, data analysis, replacing your “best and brightest”, implementation teams that never stop and post-ERP depression.

According to those who implement ERP, the first cost that companies overlook is “training cost”. The cost of training includes hiring outside professional to train employees, or sending employees outside to train. Training can take lots of time, and this will usually decrease the production rate. The second cost companies overlook is the “integration and testing cost”. If the companies buy ERP packages with a pre-integrate link that supports add-on applications such as e-commerce and supply chain, they can expect less cost. On the other hand, if the companies need to establish their own link for the application, the companies can expect a huge amount of cost.

The third hidden cost is for “customization”. This happens when an ERP software can’t support the business model and needs to be modified. This process is very painful because every part of the ERP software is connected. So, when companies successfully modify the software, they will have to do customization for every new update on the program. The result is that the company might have to hire more staff to maintain and customize the program.

The fourth overlooked cost is “data conversion”. It costs money to move data such as customer and supplier records from the original system to the ERP system. In addition to this, there is a fifth hidden cost called “data analysis”, where ERP data is combined with external data for an analysis purpose. If the companies do a significant amount of data analysis, they need to customize the system because ERP does not perform very well at analyzing. So the result is customization, which costs money.

The sixth overlooked cost is “replacing your best and brightest”. In this instance, the organization fires their veteran ERP staff because the project is completed. However, the company ends up hiring them back for consultant work because the company lacks the knowledge of how the ERP system works. This can create an enormous amount of high priced consultant fees that the company didn’t anticipate.

The seventh hidden cost is “implementation team that never stop”. In this situation, ERP staff knows more information on sales and manufacturing process than the people working in those departments. ERP staff gains valuable info because they work closely with the data in the ERP system. So in the end, many ERP staffs are force

to do reports and analysis from the ERP system. They usually end up demanding more pay, and the companies have to higher new IT staff to replace them.

The final overlooked cost with an ERP system is called “post-ERP depression”, where performance drops after implementation because employees have problems getting use to the new ERP system. This is a critical situation to address. No matter how effective a system functions, if the users are not on board or able to properly operate it, the system will not be able to produce beneficial results for the company.

There are also problems after the system is completely installed, including failure of the system. In this instance, the system failure might not be the program itself, but rather how it relates to the human component. After setting up the system, the company might have a hard time convincing their different departments to follow the new method. Several reasons exist for this. For example, the people in the department may think that the old system is better or the new system doesn't fit the way they work. These reasons cause the employees to refuse to use or demand changes to the system. If this is the case, the problem usually causes a halt in the company operations or expensive customization to the application.

There are three major tasks that must be achieved when implementing an ERP system into a business. The first is being able to determine a current and specific ERP model; secondly the company must try hard to remove all inconsistencies and last is the actual implementation of the process itself. This being said, ERP systems are not for everyone and can be extremely costly if not put together properly. While the main businesses that usually use ERP are manufacturing companies, it can be implemented

in many other different types of organizations. So while it may be possible to implement ERP in a business the question really becomes if it's practical.

Each of the three major tasks is critical for a successful installation of ERP. Determining the current and specific ERP model for a business are both extremely time consuming tasks because one cannot be done without the other. Modeling the current process of your business is much more difficult and takes much longer than an actual ERP blueprint but will act as the basis as the company tries to build their model. Without the first model it will be nearly impossible to create an ERP blueprint that will benefit the company to its full extent. The larger problem is that the current practices and procedures often are only known by those who perform them. This makes it extremely difficult to gather this critical information that is vital to implementation. However, the installation cannot be successful until the company can comprehend what protocols must be changed in the system. The key here is the elimination of the difference between the current model and the optimal ERP design.

This leads the company to the next step in the implementation process which is the removal of inconsistencies. When removing inconsistencies the company must first review the thousands of process models that the blueprint contains while at the same time determining which processes are appropriate for use. There are numerous things that can cause inconsistency in the processes. The models themselves can be incomplete, vague or inaccurate and each must be removed before the process can be implemented. Eventually the developers can seek out most, if not all, of the inconsistencies between the two processes and remove them.

The last step in the implementation process of ERP is the actual implementation. This is premised by the training of users on the processes and procedures of how to use the ERP system's features and functions. Once training is done, the company has to test its new system for other unexpected problems that can occur. After all of this, it is finally time to transfer the data, procedures and personnel to the new ERP system. The trick here is to switch systems while continuing to run the business in a fluid and timely manner. This is easier said than done, but maintaining normal business activity is critical to the success of the crossover. Each of the three specific tasks is critical in their own way, and there is no doubt they each carry an equal amount of importance.

After research, training, and implementation, there is still one important aspect that the company must consider. That aspect is evaluation. During its evaluation process, a company needs to look at a few different key areas to make sure the ERP system is working properly. The system chosen must be interacting with customers properly, as the company doesn't want to be out of sync, experience a gap in communication or completely lose contact with their valued customers. The company must also keep an eye on maintenance costs because it's possible to get a really good deal on an ERP system but they'll still have to pay massive amounts to maintain an efficiently run, effective system. It will be important for the company to look for seasonal changes that might effect how the ERP system functions and performs. Last and most importantly, the company needs to be sure that it is getting a good value for their information and daily workflow. They have to make sure that the ERP system is adapting to the company as it becomes larger or changes its outlook and that the system provides the processes that it needs.

It is easy to see how much detail is encompassed in the implementation process and ways to make it better. Knowing what the goal is when it comes to creating and developing the ERP model is extremely important. By doing this, a company can buy more specific products that will help ERP meet goals and better measure success. An ERP system touches every part of a business, and for this reason, a company should not commit to anything without a specific plan in mind. This way they can continually test and measure success as according to their blueprint.

For many businesses, enterprise resource planning is thought about and discussed but is usually far from being acted upon. It is believed by about two thirds of all CEOs that most of these endeavors end up as failures. This is thought to have cost the companies far more than they could have ever potentially earned. There is a scary thought, and it is no doubt one that crossed many of the executives' minds at Texas Instruments when they started implementing their ERP system in 1996. For once, though, a story like this one has a happy ending. ERP has made life at Texas Instruments easier by creating a global system that has allowed them to integrate all facets of their business into one simple approach. So while many companies struggle with the idea of an ERP system, Texas Instruments is reaping the benefits of a successful one, which has made many companies take a second look into the forbidding world of enterprise resource planning.

In 1996, Texas Instruments was bursting at the seams. They were setting records for sales, orders, products, and consumers, and the potential seemed endless. As their numbers continued to rise, many executives felt that soon they were going to

approach a glass ceiling. To move beyond such a ceiling, they were going to have to find a new approach to the way they did business. They needed a system that could provide a distinct advantage over their competitors while providing their consumers with benefits beyond what they had come to expect. The only real answer was that of an ERP system. While the thought of such a system was daunting, the company decided to take a gamble. Starting in 1996, with a budget of about \$250 million dollars, Texas Instruments began a four-year process of implementing a new ERP system that would transform the way they did business. Their goals were straightforward. First they wanted to create a system that could evolve and change with the market and its trends. Second, they wanted to link their customers to Texas Instruments directly through e-commerce. Lastly, they wanted a system that would be open for everyone to use. While these goals may seem simple, they were critical in the creation of a successful system.

In the year 2000, four years later, the company was pleased to report that they had accomplished most of their goals they had set out to achieve. The system allowed for their consumers, suppliers, and employees to get real time information about orders, products, and inventory. Their systems response time dropped, they had over 13,000 users, 120,000 orders and 45,000 devices. They were even receiving rewards for the system that so many companies had been scared to apply. All of these benefits did not come without somewhat of a cost. During parts of the implementation process, some of the company's productivity began to drop. The learning curves in the initial phases set even the most able employees back a few steps. The corporation was also not able to execute every order on time. The new system was allowing them to book more orders than they could successfully deliver causing trouble in their delivery approach.

Overall, however, the benefits far exceed the costs, and Texas Instruments continues to reap the benefits of this system today. Their global system has put them on the map when it comes to providing a prime example of how ERP can help a business. Their response time is higher than it ever has been, and they have increased output while reducing inventory. This ERP system allowed the company to not only break through the glass ceiling but also shatter it, making the view at Texas Instruments better than anyone could have ever imagined.

A more recent consideration for implementing an enterprise resource planning system can be seen a bit closer to home at the City of San Diego. The City of San Diego is the seventh largest employer in the county with over 11,000 employees across twenty-two departments. The city's current information technology system was designed in 1978 and is run by three different groups with no specific one in charge: an IT department, IT employees in different departments, and the San Diego Data Processing Corp. (a nonprofit owned by the city). The City of San Diego's IT system has been the center of much debate, which sparked a two-month long audit by the San Diego Union-Tribune that determined the "current system defies efficiency and accountability." The city's IT system is a patchwork of mainframe computer programs, incompatible software and outdated machines. The system, simply put, is in shambles.

The San Diego Union Tribune provided in-depth insight into the City of San Diego's crisis. The audit determined that the city has no idea how much is being spent on computer systems each year because some departments don't track expenditures which makes it impossible to determine an overall number. In addition, some well-

financed departments have modern equipment, but others with no money rely on interns and volunteers to write computer programs to try and meet objectives. With the current system, it can take up to three days to be able to get simple financial reports. The city has no master inventory list of equipment, and of the equipment they could track, 5,788 desktops computers were at least four years old and some of the hardware dates back almost thirty years. Individual departments within the city cannot interact with each other because the system is not fully integrated, and citywide, departments do not share information about customers. Sadly, only one-half of the security updates are installed automatically and the rest are done manually, which subjects the system to serious breaches in security and exposure to viruses. Even with all this said, what the City of San Diego could track with regards to information technology expenditures produced a startling end result: the city has spent \$78 million so far this fiscal year.

Many of the departments within the city that are suffering due to the IT debacle are vital to the health and public safety of San Diego constituents. For example, firefighters on the way to a call have to flip through binders of paper reports to determine things such as hazardous materials and to locate gas shutoff valves in buildings housed in the neighborhoods they serve. Another example is the Emergency Operations Center. This department is the city's control room for disasters. It's outfitted with thirty computers that are out of warranty, which were obtained from the city's warehouse where discarded PCs and replaced computers are housed that were obsolete and broken. Both of these instances show how critical the information technology crisis is to not only the city, but also to the people who reside within its limits.

The city has taken baby steps to fix the internal IT problems. Early this year, they contracted with Northrop Grumman Information Technology to run a centralized system. They also are converting all departments to one e-mail system. However, the overall solution that the city is proposing is to implement an enterprise resource planning system that will address all their needs. An ERP system would integrate the city's accounting, payroll, purchasing, employee records and other functions. In April, the city's proposal was brought to the city council to determine whether such a system would be implemented. The city estimates that the system would be fully installed by January 2009, with a total cost of \$36.5 million. The city expects to fund the project with a seven year loan of \$29.5 million from IBM Credit, LLC at an interest rate matching that of a seven year treasury note. The remaining \$7 million would be paid in cash from the city's existing funds. Current software being considered are Oracle and SAP. The city anticipates hiring an outside company to perform the integration and transition its existing system into the new enterprise resource planning system.

The City of San Diego council, however, is not without reservation. Although the council is in agreement that the current system is fatally wounded and that the ERP system implementation seems like a viable solution, there are many concerns that mimic those that all businesses experience when contemplating an implementation. The council is concerned with possible cost overruns. At an already pricey cost of \$36.5 million, it is estimated that overruns could surge to an additional \$10 million. For a city already plagued by financial difficulties due to its pension scandal a few years ago, funding the overruns may not be feasible. The council is uncertain that the City of San Diego could withstand a large overrun balance.

In addition, council members fear a lack of budget control on the project and a shortage of staff to support the implementation. Due to the city's financial crisis, it is preparing to cut 692 jobs in its upcoming budget. With staff cutbacks, the question becomes who will be able to maintain and operate the system once it is installed. In addition, the council members are direly concerned about whether the system will function as it is advertised once it is installed. The city is in no position to have an unsuccessful execution of the project because of its current financial crisis. If the system doesn't work properly, the City of San Diego will be left with an old system that is less than ideal and a new system that doesn't handle the operations it was intended. In this instance, while an ERP system seems practical, it remains to be seen as to whether it will prove fruitful for the City of San Diego.

Enterprise resource planning is not for every business out there. It requires a lot of time, a lot of money, and a lot of patience. All businesses, even the most sophisticated and organized ones, will probably not have a completely successful implementation process. The installation of a program such as this one is usually a painstaking process with numerous bumps in the road. The significant changes in particular work practices and the actual time it takes for implementation can all cause concern. However, if a company can overcome these obstacles and implement a successful program, it will no doubt enjoy a more success filled business. The amount of time, money and resources that a system like this can save a company is immeasurable. One just has to make sure the company is up to the challenge.

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