CHAPTER 1: INTRODUCTION TO ENTERPRISE SYSTEMS FOR MANAGEMENT

CHAPTER OBJECTIVES:

- Understand the information systems evolution and its historical role in organizations leading to systems integration and eventually Enterprise Resource Planning (ERP).
- Learn about ERP systems and their evolution, components and architecture. Understand the benefits and drawbacks of implementing ERP systems and how they can help an organization improve its efficiency and worker productivity.
- Have an overview of the implementation process (e.g., the ERP life cycle, business process reengineering, project management, and change management). Understand the role of staff, vendors, consultants, and the organization in making the ERP implementation process successful.
- Comprehend the ethical, global and security challenges while implementing an ERP system, as well as get an overview of ERP vendors and industry trends.

CHAPTER OUTLINE:

- I. Opening Case: Hershey's Enterprise 21 Project
- II. Preview
 - a) Enterprise Systems in Organizations
 - b) Information Silos and Systems Integration
 - c) Enterprise Resource Planning (ERP) Systems
- **III.** Enterprise Resource Planning Systems
 - a) What is an ERP?
 - b) Evolution of ERP
 - c) Business Process and ERP
 - d) ERP System Components
 - e) ERP Architecture
 - f) e-Business and ERP
 - g) Benefits and Limitations of ERP
- **IV.** ERP Implementation
 - a) Business Process Management
 - b) ERP Life Cycle
 - c) ERP Implementation Strategies
 - d) Software and Vendor Selection
 - e) Operations and Post-Implementation
- V. People and Organization
 - a) Project Management
 - b) Role of Consultants
 - c) Change Management
 - d) Business Process Reengineering
 - e) Global, Ethical and Security Management

- VI. ERP Vendors
 - a) Key Vendors
 - b) Software Extensions and Trends
- **VII.** Implications for Management
- VIII. Summary
- **IX.** Exercises
- **X.** Review Questions
- **XI.** Discussion Questions
- XII. Real World Case: Rolls Royce's ERP Implementation

CHAPTER OVERVIEW

This chapter provides a quick overview of the Enterprise Resource Planning (ERP) implementation process and the various topics covered in the remaining chapters of the book. It begins with an overview of the information systems field and defines ERP systems a few different ways, explaining their origin and evolution, and describes important components and basic implementation options. In addition, it discusses the evolution and role of ERP in the organizations and provides reasons for the popularity of ERP systems today.

ERP systems are comprehensive applications that support and connect all aspects of an organization's business processes. When discussing business processes, one means such departments as Accounting, Human Resources, Marketing, Purchasing, Manufacturing, etc. ERP systems appeared in the 1990s as a way to provide accessibility, flexibility and consistency across all the major business functions, unlike its predecessors. Organizations that use ERP systems have a better chance of sustaining competitive advantage in an ever-changing business environment.

The evolution of ERP started during the early 1990s after decades of using silo-based information systems within business organizations. ERP is a software-based system that is responsible for making information, reporting and functions widely available and centrally located within business organizations. In addition, the chapter continues to explain that ERP implementation is not as easy as selecting and installing packaged software. The opening Hershey case shows how a business went about the process the wrong way, and then corrected their mistakes the second time around. Hershey went live with their ERP implementation via the "Big Bang" method. Their initial problem was trying to implement too much, too fast. The case provides a good example of what to avoid.

The five important components have to work together in order to create an ERP system. These components are: hardware, software, information, processes and people. Hardware consists of the physical equipment such as servers and peripherals. Software is the operating system and/or database that the company or specific department uses. Examples of software today are Windows XP or Win 7. The information component is basically the data that is input to the system by internal or external organizational resources. Processes consist of policies and procedures that create the ways of conducting their business. The people of an ERP system are the end-users and IT staff. End-users can be anyone from the employees to the suppliers of a company.

Another interesting aspect of ERP systems covered in this chapter is how they are implemented in organization. Just like homes and large scale buildings, ERP systems have an architecture that the implementers must follow. Most of the time, a vendor is the one who

creates the ERP architecture when an organization wishes to purchase outside the company. The two types of architecture for an ERP System are logical and physical. Logical architecture supports the needs of the end-users while physical architecture focuses on the efficiency of the actual ERP system. With logical ERP architecture, one must carefully examine what will make up the layers, or tiers, in the blueprint.

The different facets and features of an ERP system are explained throughout much of the chapter. Vanilla and chocolate architectures are explained in terms of their strengths and weaknesses. Package-driven (vanilla) ERP architectures are "off-the-shelf" implementations that are generally much quicker to get up and running. Chocolate architectures are customized options. Both architectures have their ups and downs. Vanilla implementations are quicker and less expensive; yet do not fully conform to the organization's business procedures. Chocolate architectures take more time and money to configure, and may be more difficult to upgrade; but they can result in a more ideal ERP system for the organization.

Implementation strategies and the product life cycle are discussed. Both sections stress the importance of taking it slow during this process. It is important to stay on track and follow the initial implementation plan through completion without getting bogged down by minor issues or changes. Preparing for implementation is one of the most crucial times for an organization when replacing their current system with a new ERP system. It is important that the organization create an implementation committee in order to communicate necessary changes. These members should be knowledgeable enough to understand and plan for the implementation process itself. Another key decision a company must settle on is whether or not they should change their business processes to fit the ERP system. If they decide to do so, this is known as "vanilla implementation." It minimally modifies the ERP system that is purchased from the chosen vendor. This implementation committee needs to also understand the ERP life cycle and methodology during this process. With a well-defined methodology, a company is able to take one step at a time, define objectives, and plan a budget for the ERP implementation.

The following sections deal with vendor selection, "going live", and postimplementation. The chapter gives good advice about what criteria should be considered when trying to decide upon a vendor. After a vendor is chosen and testing has been completed, it is time to "go live" with the software. This section warns that this can be the riskiest stage, and also provides examples of implementation disasters. Guidelines and tips for maintaining the system after the "go live" stage are also discussed.

Beyond the architecture and implementation process, this chapter compares the technologies of e-Business and ERP. During the 1990's, there was speculation that e-Business and ERP would compete as technologies. However, the technologies have developed more, and now work together to provide a wider range of business support. Also, the Microsoft example presented in the middle of the chapter exemplifies the optimal outcome of a successful ERP implementation. Microsoft utilized the ERP vendor SAP to restructure its systems which resulted in annual savings of eighteen million dollars, and a greatly improved information system with significantly decreased data redundancies.

Towards the end of the chapter is an exploration of business process management and the people involvement during the implementation of ERP systems. Process change and people are the most important factors for success. There is advice on choosing project managers and vendors, how to deal with change management, and finally, some of the key vendors on the market. Most organizations purchase ERP systems through outside vendors such as Oracle or SAP. Vendors need to fulfill certain criteria of a company in order to be considered. Project

management and change management help create trust among the people involved in overseeing the new ERP system, and closely monitor objectives of the implementation plan.

The chapter ends with some implications for management in the ERP process. In sum, it gives a good step-by-step introduction to key information about ERP. It explains its development, components, limitations, successes, risks and the process of establishing an implementation plan. It also gives the reader so much information about ERP systems that it acts as a summary for the rest of the book in itself. Additionally, tables in the summary section provide a quick overview of benefits and limitations of ERP systems.

ADDITIONAL RELATED INFORMATION

- 1. http://en.wikipedia.org/wiki/Enterprise resource planning
- 2. <u>http://www-</u> 03.ibm.com/solutions/businesssolutions/doc/jsp/indseg/solutionarea/erp/index.jsp
- 3. http://www.centredaily.com/business/technology/story/496923.html
- 4. <u>http://olcsoft.com/top%20ERP%20vendors.htm</u> an exhaustive list of current ERP vendors
- 5. <u>http://en.wikipedia.org/wiki/Information_systems</u> review of information systems including history of, and applications
- 6. <u>http://erpwire.com</u> general information about ERP and ERP vendors
- 7. <u>http://media.wiley.com/product_data/excerpt/80/04712351/0471235180.pdf</u> a chapter discussing ERP implementation in detail
- 8. <u>http://www.dba-oracle.com/art_insider_erp.htm</u> information about the vendor selection process
- 9. <u>http://www.cio.com/topic/1463/ERP</u> a good general resource for ERP questions and product information

ANSWERS TO END-OF-CHAPTER REVIEW QUESTIONS

1. How is the role of an ERP system different from traditional TPS, MIS, DSS and others? Can an ERP system support all levels of management?

An ERP system is different in that it brings all departments within an organization together. It seeks to unite all departments, open communication and consolidate all databases into one accessible database. Previous information system models did not have this focus or ability. ERP can support all levels of management, because it allows each level to utilize information in a customized manner. Upper-level management can utilize reports suited to their positions as overseers, while operational management can utilize detailed reports for their specific functions.

2. Discuss the evolution of information systems in an organization. How can the use of ERP systems remove information or functional silos in organizations?

Most organizations start out with basic information systems, and build from a standard platform as they grow in size and needs. As their needs and market positions change,

3. Among all the ERP components listed in the chapter, which component is most critical in the implementation process and why?

People, including all levels of employees and management, are the ones that will use and be affected by the ERP system. It is critical that all are on board with the decisions that are made, and willing to give feedback during all stages. An ERP system cannot be successful unless the people of an organization are willing to accept the possibility of change and business reform.

4. Discuss the role of ERP in organizations. Are ERP tools used for business process reengineering (BPR) or does BPR occur due to ERP implementation?

Implementing an ERP often means BPR will take place. Organizations should realize that the purchase of ERP software requires some changes to business practices in order to run smoothly. Vanilla implementations will require the most amount of BPR, while chocolate implementations (although more difficult to get up and running) will likely require less BPR in the long run.

5. Why is the design and selection of ERP architecture crucial for the implementation project? What are the long-term implications of selecting a wrong architecture?

A business organization must start with the correct architecture to meet their needs for a new ERP system. If they choose a chocolate implementation, but really only need a package-driven vanilla architecture, they may waste large sums of company money and time. Chocolate implementations can be very time consuming and costly. Also, vanilla implementation architectures are toted as being the best option from vendors, as they utilize the "best business practices" across various industries.

6. Discuss the criteria for selecting ERP vendors. Which is the most important criteria and why?

The criteria to consider are what industry the ERP vendors specialize in and what sizes of organizations their software supports. Also important to consider is the reputation of the vendor, how successful their implementations have been and their outlook in terms of longevity. Other items to seriously consider are their customer support services, total cost of ownership, IT requirements for the software and the ability to integrate third-party software.

7. From the examples provided in the chapter on ERP success and failure stories, what are the critical factors of success and failure?

8. What are the critical steps of an ERP project cycle? Discuss the critical success factors.

The first critical step is to identify a project manager and subsequent teams. Then, to find a vendor that is able to deliver solutions identified by the project manager and upper management is the next step. Other important steps include establishing a project timeframe, deciding if consultants are necessary, and most importantly performing adequate ERP testing. Finally, after going live, it is essential to work closely with the consultants to solve any problems that may arise during implementation. Keeping these steps in mind will aid in a successful project implementation.

DISCUSSION QUESTIONS

1. Refer to the Hershey case. What were the goals and details of the Enterprise 21 project?

- 1. Establish a single supply chain across all divisions.
- 2. Streamline all business processes by reengineering them across all functional areas.
- 3. Increase the gross margin and maintain sales growth.
- 4. Save \$75 80 million through corporate restructuring and closing of older distribution sites.
- 5. Fix their Y2K problem and replace existing mainframe environment.

2. Refer to the Hershey case. What were some of the key problems that Hershey encountered when choosing, integrating and implementing their new ERP system?

The implementation of the ERP for Hershey was beset with difficulties due to a number of failures:

a. Project management issues, not faulty software: The company did not use the proper resources do ensure a good launch. This especially includes the failures of top management.

b. Big Bang versus phased implementation: With their second attempt Hershey was able to plan more thoroughly in order to reduce redundancies, properly train and troubleshoot on a manageable basis.

There were several key problems Hershey faced during the implementation of their new system:

- Lack of upper level management—the absence of IT executive leadership before the arrival of George Davis.
- Lack of a perspective—lower level managers were making decisions based on their individual business needs rather than addressing the needs of the company as a whole.
- Big bang approach—three new systems were implemented simultaneously, rather than employing a phased implementation.
- Bad timing—systems were implemented during Halloween, Hershey's peak sales season.
- Improper architecture and lack of training—data entry into SAP was difficult and employees were not properly trained.

3. Refer to the Hershey case. What difficult lessons did Hershey learn from this entire process? Did Hershey ultimately achieve its original goals by implementing this new ERP system?

Hershey did meet its business and IT goals with the upgrade to SAP/R3. They learned the following:

- Top management must be on board from start to finish during and ERP implementation. They appointed George Davis as CIO and had other top executives participating.
- All data requirements need to be clearly defined before implementation begins. Hershey's internal data users communicated their data requirements to the implementation team which was directed by a steering committee which included top management like the CEO and CIO.
- Slow and steady wins the race. Instead of choosing the hard cut in option as they had in the past, they rolled out the final upgrade.
- Know your business. Basic business definitions and processes were not left to external consultants but defined by involved internal resources.
- Don't try to do everything all at once. Spend appropriate time and resources testing the new system. Keep things simple by limiting the number of software applications in the new system.

4. Provide examples of ERP components in an organization that you know of or where you are working. Provide examples of the hardware, software, people, processes and databases.

Good to read about ERP systems at your work. Another good example of ERP is the ISIS system that you are using for course registration, etc.

Basically, ERP integrates all data and processes of an organization into a unified system. A typical ERP system will use multiple components of computer software and hardware to achieve the integration. Ideally, an ERP system delivers a single database that contains all data for the software modules, which would include:

Manufacturing – Engineering, Bills of Material, Scheduling, Capacity, Workflow Management, Quality Control, Cost Management, Manufacturing Processes, Manufacturing Projects, Manufacturing Flow.

Supply Chain Management – Inventory, Order Entry, Purchasing, Product Configurator, Supply Chain Planning, Supplier Scheduling, Inspection of goods, Claim Processing, Commission Calculation

Financials – General Ledger, Cash Management, Accounts Payable, Accounts Receivable, and Fixed Assets.

Projects - Costing, Billing, Time and Expense, Activity Management

Human Resources - Human Resources, Payroll, Training, Time & Attendance, Benefits

Customer Relationship Management – Sales and Marketing, Commissions, Service, Customer Contact and Call Center support

Data Warehouse and various Self-Service interfaces for Customers, Suppliers, and Employees.

5. If you had a choice between customizing an ERP application to meet the organization processes and modifying organization processes to meet the ERP functionality which would you choose? Explain.

I agree with some of the comments made on this DB, namely, if you have to choose between process change vs. customization, then go for process change. In the long-run more benefits are accrued with this option. However, a lot depends on the organization's goal and objectives and people. Basically, customizing the package (commercial off-the-shelf software) has lots of headaches especially when the technology upgrade becomes necessary.

Another benefit of minimizing customization is the opportunity to rethink and improve business processes. Very few firms actively seek out improvements in business processes and instead they rely on technology changes. Many of the vanilla installations have built best practices for business processes.

However it does depend on the gap between the systems best practices and the company's current practices. With a wide selection of ERP vendors available, a company could benefit from thorough research to determine which package best fits the company's needs and is suitable for the specific industry.

Once the vendor is selected, it's best to stick with as 'vanilla' of a solution as possible. It will keep costs down and allow easier support and upgrades. But it will require changes in employee habits. The resistance that will come from employees forced to change how they work is absolutely unavoidable, so with a vanilla implementation, managers must be prepared to deal with the resistance and have the confidence to coach employees through the changes.

6. Where are ERP systems heading in the future? Do you agree or disagree with the trends discussed in the chapter? Explain.

The **ERP** market has matured to a point where heightened competition has brought declining sales. As a result, **ERP** vendors are expanding their functionality to add-value and support new organizational needs from compliance management, customer support, global supply chain, and emerging technology platforms such as open source software and Service-Oriented Architectures (**SOAs**). Open source addresses a key concern in this instance. Often, **ERP** vendors pitch to smaller enterprises packaged applications that they can run as is, requiring little or no IT investment. It's a logical pitch in environments with scarce technology resources.

Another trend among big vendors has been to expand their software market for small to medium size business. The saturation of the demand in big business and the lucrative nature of the small and mid sized business market has led vendors like **SAP** and **Oracle** to enter the small to mid size business market, too.

According to an article by Roberto Michel, senior contributing editor of Manufacturing Business Technology, the market for **ERP** software—the integrated enterprise management suites that companies rely on for everything from accounting to manufacturing management—is clipping along nicely. Some analysts peg market growth as high as 10 percent; but despite this healthy outlook, it's a space that has undergone major transformation in the last several years.

Most recently, the biggest vendors devised new middleware platforms aimed at supporting service-oriented architecture (SOA) in which functionality could be more flexibly delivered as services. Analysts say **ERP** vendors are adjusting to this **SOA** era, but maintain that factors such as ease of integration and industry functionality still weigh heavily in user purchasing decisions.

7. Why is it necessary for the project triangle to be balanced at all times for project success? Discuss the implications of an unbalanced project triangle.

An unbalanced triangle leads to cost overruns based on scope creep and resource constraints. Project scope must be balanced with time and resource constraints otherwise the implications are project failure, cost overruns and scope creep.

ROLLS-ROYCE CASE QUESTIONS

RR did a good job in planning user and SME involvement and got early help of external consultants to make sure their implementation was successful.

1. What do you think of RR's ERP Implementation project? Did they select the right implementation strategy?

2. Discuss the Critical Success Factors of RR's implementation strategy and the role of SMEs in the project.

RR had knowledgeable and cross-functional SMEs on the project that were able to overcome a major issue in most implementations, that is, SMEs inability to think about functions across the organization.

3. What advice can you give to RR's technical team on their approach of migrating the legacy system to the SAP software?

Conversion is usually the critical path with data cleansing taking the longest. Clean data is the key to the overall success of an implementation. In addition, minimizing the number of interfaces and retiring legacy systems should be the focus of the technical teams.

CHAPTER 2 – SYSTEMS INTEGRATION

CHAPTER OBJECTIVES

- Understand the impact of organizational structure on information systems
- Find out about the types of functional silos in organizations
- Learn about the evolution of information systems technology generations and architectures and their influence on a silo environment
- Know what systems integration is and why it is important for organizations
- Understand the role of Enterprise Resource Planning (ERP) systems in systems integration

CHAPTER OUTLINE

- I. Opening Case: AIR CARGO's e-ENTERPRISE SYSTEM
- **II.** Functional Silos
 - a) Horizontal Silos
 - b) Vertical Silos
 - c) Business Process and Silos
- **III.** Evolution of IS in organizations
 - a) IS Architectures
 - b) IS Fictionalizations
- **IV.** Systems Integration
 - a) Logical Versus Physical SI
 - b) Steps in Integrating Systems
 - c) Benefits of System Integration
 - d) Limitations of System Integration
- V. ERP and Systems Integration
 - a) ERP's Role in Logical Integration
 - b) ERP's Role in Physical Integration
- VI. Implications for Management
- VII. Case 2-2 Real-World Case: Systems Integration at UPS Corp

CHAPTER OVERVIEW

This chapter discusses the evolution and importance of Systems Integration and the role of ERP systems in systems integration. The chapter begins with a discussion on information silos. If you think of an agricultural silo it is an immense vessel used for storing grain, as a representation of departments in a company. Just like a agricultural silo is self contained and has all the resources it needs with little interaction with the outside world, a silo'd information system is separated and does not work together with other systems. The chapter discusses two types of "silo" systems we can see in a company: Horizontal—that is each department is on the same level within the company, granted the higher ups will be somewhere above that; essentially

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the hierarchy is very wide and not very tall. Vertical—that is the system is fairly narrow and tall; envision a pyramid, strategic management on top, tactical management in the middle, and the functional operations of the company at the bottom, supporting it all. The chapter also discusses the idea of a matrix structure, which combines both ideas of horizontal and vertical silos, to create a strategy driven company that works both equally and unequally to achieve the company objectives.

The next topic covered is the evolution of IS in organizations. The initial use of functional silos was successful when companies were small and information sharing requirements were limited. The information silos, by preventing the sharing of information, create bottlenecks and lead to inefficiency and mismanagement, inaccuracies and errors. Also, it can become a breeding ground for incompatible data and lead to poor management decisions. Without an integrated system it's harder for departments to work together; for example, the inventory and customer sales departments communicate on a regular basis and they do not have a structured way of exchanging information. Silo systems process data differently and store data in different formats, and before you know it, there are forwarded emails going to the wrong people, orders misplaced, and inventory inaccurately tracked.

In addition, the chapter covers how IS architecture, has, over a period, evolved, driven by innovation and organizational requirements which were 1) Centralized, 2) Decentralized, and 3) Distributed. Having an integrated system allows for functional departments to get the information they need while having a broad, company wide system. Modern ERP systems allow for companies to have a centralized data and information source that can be updated and represented at all levels of the company. These organizational structures allow for better use of data simply by design.

Physical and logical systems integration is another key point. Physical integration is the integration of data systems across a company designed to provide a seamless network of information and decision making tools. Logical or human integration allows for "logical" understanding of information both between company people as well as company and customers/stakeholders.

There are many pros and cons of systems integration. Some of the benefits of Systems Integration is increasing revenue and growth, information visibility, standardization, and balancing the competitive environment against competitors. Some of the drawbacks of Systems Integration is the initial cost of designing and implementing the system, and not having a full understanding of the long term and intangible benefits that may be present. Also, power and interdepartmental conflicts may require some business reorganization to conform to the new system, in the hopes that things will work and flow better.

ADDITIONAL INFORMATION

Good information on the TJX hack attack, includes how it was hacked and what was wrong with the TJX system

1. http://www.informationweek.com/news/showArticle.jhtml?articleID=196902075

ANSWERS TO END-OF-CHAPTER REVIEW QUESTIONS

1. What are functional silos and how did they evolve in organizations?

Functional silos evolved when organizations became larger and complex structures. This happens when companies have separations of responsibilities and duties into departments. When departments form in a company they tend to need different things, and then develop their own methods of obtaining their goals, or use methods laid out by higher-ups. Each department operates separately with little or no interaction with each other; they are autonomous and function without the rest of the company.

2. What is the relationship between organizational functional silos and IS functional silos?

The relationship between these two types of functional silos is that they both serve the needs of a department, but this is done in two different ways. Traditional functional silos operate as independent units with their required information; changes made within these silos are not propagated to other departments. With an IS functional silo there is no online sharing of data and it creates a situation where data has integrity or currency issues.

3. Compare and contrast centralized, decentralized, and distributed IT architectures. Which do you think is most appropriate for ERP and why?

Centralized systems are usually based on servers, mainframes, and supercomputers, where all the data, software, and resources are stored on the server and are accessed via dumb terminal computers, that is, nothing is really stored on the satellite computers. On other hand, decentralized is just the opposite; we have multiple small computers with the information and software they need, this gives them full control over what takes place, but may lead to less real time cooperation. Finally, distributed architecture is a combination of both centralized and decentralized architectures with their own applications and tools, accessing data and resources from a shared and very centralized network location. I think the most appropriate system for ERP is the distributed architecture as it blends both centralized and decentralized, and boasts better data consistency and integrity.

4. List the horizontal and vertical levels of systems that exist in organizations.

Vertical Levels of systems \rightarrow going down

- Strategic Management
- Tactical Management
- Functional Operations

Horizontal Levels of systems \rightarrow going across

- Human Resources
- Accounting
- Finance
- Marketing
- Manufacturing
- MIS

5. What is logical integration and how is it different from physical integration?

Logical or Human systems focus on integration of business process and people changes for successful use of systems by getting people to share information across functional areas with relative ease. On the other hand, physical systems integration involves building a system architecture that supports many different applications, and gets them to work together seamlessly.

6. Describe at least five steps involved in systems integration.

Step 1 – Resource categorizing – take inventory of hardware and software and seek vendors that comply with this technology

Step 2 – Compliance and standards – check to see what kinds of standards are used for database support JDBC/ODBC

Step 3 – Legacy systems support – develop support for older systems

Step 4 – Middleware tools – tools that are used to support legacy systems, and are a short-term solution to fixing the problem

Step 5 – Authentication and authorization policies – Create standards that users can login and log off to create information protection, to hide sensitive information.

7. What are the key benefits and limitations of systems integration?

Some of the key benefits to Systems Integration:

- The increase of Revenue and Growth
- Enhanced information visibility
- Standardization of data
- Better business practices and
- Levels the competitive environment with competitors.

Some of the Limitations of Systems Integration:

- High initial setup costs
- ROI with benefits showing up after long time
- Power and Inter-departmental Conflicts.

8. What is the role of ERP systems in systems integration?

ERP can play a crucial role in systems integration, with Logical systems integration it forces companies to focus on business processes and practices instead of focusing on function alone. Also ERPs allow for co-influence of departments, which forcibly removes the Silo concepts from a business. With physical integration, ERP systems force companies to focus on upgrading and removing legacy systems, and also forces companies to improve flexibility and fluidity throughout the system.

9. Summarize the role of management in systems integration.

Management has several integration issues it has to face. First, it has to accept that Silos do not work and to begin accepting an integrated information system to store and use data. They also have to understand that Systems Integration has many hidden benefits and many challenges; they will need to look to make improvements while not underestimating the challenges. Likewise, they will have to overcome the challenges without missing the very possible and very intangible benefits of an Integrated System. Finally, integrated systems also raise many ethical issues, with more electronic transactions taking place, customer information becomes more often a source of information, but that information is private to the customer, and could pose many problems if it were to be released to the public. Such an example would be the TJX incident.

DISCUSSION QUESTIONS

1. Refer to the AirCargo Case in the chapter. Discuss the silo problem at ACI and how it was solved via the eEnterprise system.

The systems passed data applications using import/export of text files creating a delay reporting and the data being dated. ACI used the Data Transformation Services product from Microsoft to pass data real-time between its enterprise systems.

2. Refer to the AirCargo Case in the chapter. Discuss both short-term and long-term benefits of the eEnterprise system.

The short-term advantage of eEnterprise system is that it links the systems together such that a single update is propagated across the enterprise, reducing data entry errors and timing problems.

The long-term benefit is that the systems provide the building blocks that enable two-way information flow between ebusiness and financial systems.

3. Why do you think functional silos are not appropriate for today's organization? Discuss your answer from organizational and technical perspectives.

In the internet world of today information needs to be timely and available. Systems that do not talk to each other will create bottlenecks in processing information within a company. Eventually decisions will be made without the latest information and possibly a loss of revenues.

4. What is the relationship between the logical and physical system integration? Why is it important for organizations to have both together?

Logical integration allows organizations to share data with all of its stakeholders. Physical integration provides seamless connectivity between heterogeneous systems. If the application systems are not seamless, sharing of data in a timely fashion with all of the organizations stakeholders is not achievable.

5. Why is business process re-engineering needed for implementing an ERP?

As with most ERP implementations the system is designed for "leading practices". An organization would benefit from understanding how the business processes will lead to better efficiency and quality. Current organization business practices would need to be reviewed and analyzed with the implementation of the ERP in order to take advantage of these "leading practices"

6. Discuss the role of management in systems integration in terms of the ethical and other challenges they face during the systems integration process.

Management must understand the tangible and intangible benefits of integrated systems. Decision making across the organization is cascaded to all employees in the organization at all levels creating a more productive environment and satisfied employees.

UPS CASE QUESTIONS:

1. What are some of the system integration challenges faced by UPS?

UPS had acquired more than 30 other companies since going public in 1999. They had over 3,600 IT professionals, 14 mainframes, 2,755 mid-range computers, 6,200 servers and over 260,000 PCs. Its systems were not well integrated and therefore, not easy to pass data between them.

2. Discuss the systems integration solutions at UPS. How does it help UPS integrate new technologies?

They consolidated data centers and chose to implement products across all the lines of business. This was achieved through a focus on the business objectives and not the technology.

3. Discuss the advantages of systems integration for UPS customers.

Customers can track the status of packages around the globe through a single web-based system. It puts the power directly in the customers' hands to know the status of a package.

CHAPTER 3: ENTERPRISE SYSTEMS ARCHITECTURE

CHAPTER OBJECTIVES:

- Examine in detail the enterprise systems modules and architecture.
- Understand the implication of good architecture on ERP implementation.
- Know the various types of ERP architectures and the related benefits and drawbacks of ERP architecture.
- Learn about Service Oriented Architecture and its impact on an ERP system.
- Learn about cloud architecture and its impact on an ERP system.

CHAPTER OUTLINE:

- I. Opening Case: Nestlé's ERP Implementation
- II. Preview
 - a) Why Study Enterprise System Architecture?
- **III.** ERP Modules
 - a) Production Module
 - b) Purchasing Module
 - c) Inventory Management Module
 - d) Sales & Marketing Module
 - e) Finance Module
 - f) Human Resource Module
 - g) Miscellaneous Modules
 - h) Benefits of Key ERP Modules
 - i) Self-Services
 - j) Performance Management
 - k) Financials
 - 1) HR Management
 - m) Procurement and Logistics Execution
 - n) Product Development and Manufacturing
 - o) Sales and Service
- **IV.** ERP Architecture
 - a) Layered Architecture Examples
 - b) Data Tier
 - c) Application Tier
 - d) Web Tier
 - e) Infrastructure Requirements
- **V.** Types of ERP Architectures
 - a) Three-tier Architectures
 - b) Web Services Architectures
 - c) Service-Oriented Architectures
 - d) SOA and Web Services
 - e) Enterprise Content Management and SOA

f) Cloud ArchitectureVI. Implications for ManagementVII. Real-World Cases: WiPro and MBH

CHAPTER OVERVIEW:

Chapter 3 provides an overview of the enterprise system architecture, the different major modules that make up an ERP system and why they are beneficial, and the different architectures that can be used in an ERP implementation.

The concept of enterprise system architecture revolves around the functional and technical needs of an organization in order to build a successful system foundation. Both organizational functions and technical components of enterprise systems are not only complex in and of themselves, but also have a complex relationship that must be understood by management and the implementation teams. When applied to an ERP system, the enterprise system architecture identifies the ERP modules required for the organizational functions (accounting, human resources, sales, production, etc), while the technical components (servers, networks, software, clients, etc.) are identified in the layers or tiers of the infrastructure.

The primary purposes of an ERP system are to support the different functions of an organization, share information across the enterprise, and reduce/eliminate storing data more than once. Some of the more common modules that allow an ERP system to perform its function are listed below:

- PRODUCTION MODULE: previously known as Manufacturing Requirements Planning (MRP) systems, this module assists in planning and optimizing the manufacturing function by using historical data to project production and sales and determine what resources will be needed at a given time. *Benefits: shorten time-to-market and delivery of higher-quality products*.
- PURCHASING MODULE: this module assists the purchasing functions of an organization by identifying existing and potential suppliers of raw materials and supplies, negotiating prices, awarding sales to suppliers, and billing. This module is often integrated with supply chain management software and business-to-business applications so that orders with suppliers can take place electronically and with limited intervention. *Benefits: cost savings, improved resource utilization, and improved productivity.*
- INVENTORY MANAGEMENT MODULE: this module supports the inventory management functions of an organization by managing appropriate levels of materials and supplies based off projected needs. Inventory is monitored, reconciled, replenished, and reported on by the module so that inventory is on target and not over-stocked or under-stocked. *Benefits: cost savings, improved resource utilization, and improved productivity.*
- SALES & MARKETING MODULE: the sales portion of this module supports the revenuegenerating functions of an organization through entry, scheduling, shipping, and invoicing of customer orders. This function is often front-ended through e-commerce websites and online stores. The marketing portion of this module supports the generation of sales leads and advertising. *Benefits: increased sales and incentive/commission performance measuring*.
- FINANCE MODULE: this module compiles financial data from the other functional modules of the ERP system and generates reports that describe the financial position of an organization. Reports include budgets, balance sheets, general ledger, trial balance, and financial

statements. *Benefits: cost control, regulation compliance, and financial/accounting automation.*

HUMAN RESOUCE MODULE: this module manages all of the human resource information of an organization, such as employee demographics, salaries, benefits, performance evaluation, and promotions. Often this module is integrated with Knowledge Management Systems (KMS) that can compile employee data and allows an organization to best utilize the skills of each employee. *Benefits: employee attraction and retention and increased efficiency*.

While the modules of an ERP system support the functional silos, ERP architecture also defines the system components required of an organization. The four ERP system architectures are listed below:

Three-Tier: Composed of the Presentation, Application, and Database layers, the ERP servers no longer share the responsibility of application and database functions as they are split. The primary benefits of this architecture are scalability, reliability, and flexibility; however, infrastructure cost and complexity are greatly increased.

Web-Based: Composed of the Web Services, Web Browser, Application, and Database layers, the ERP system splits the Presentation layer so that use of the system can extend beyond the walls of the enterprise and can be used by remote users or third-party organizations via web-based technologies. The primary benefit of this architecture is expandability since anyone with appropriate permissions can access the ERP application from anywhere there is Internet connectivity; however, security and performance can be impacted since data transmission has left the control of the organization.

Service Oriented Architecture (SOA): More of a methodology than a technology, the functions of a business are broken up into application services that can be reused in other modules throughout the organization. Unlike object-oriented architectures, SOA can extend beyond the walls of the enterprise much like Web-Based architecture. The benefits of SOA are reuse of software services across the enterprise, and location/system independence; however, because of its complex design, performance can be impacted, security must be sophisticated, and it's costly.

Cloud computing architecture has gained tremendous popularity in the last few years with all major vendors announcing cloud-based services. All organizations should keep an eye on this platform as Internet connectivity improves both in speed and reliability. There are some privacy and security concerns, which limit the use of this platform currently for ERP; however, this will change in the near future.

When an organization has made the commitment to implement an ERP system, managers must keep a few things in mind: As the foundation of a successful ERP implementation, proper enterprise system architecture must be identified and used; ERP architecture is complex and requires vigorous attention, commitment, and involvement from the entire organization, not just Information Services. In order to take advantage of an ERP system over the long term, organizations must identify one that is flexible with respects to infrastructure, accessibility, and reach. Organizational management must perform an unbiased evaluation of ERP systems by

filtering out vendor hype as the best system is the one that fits an organizations culture, business needs, processes and procedures, and budgets.

ADDITIONAL RELATED INFORMATION:

- 1. "Service-oriented architecture." Wikipedia: The Free Encyclopedia. 28 March 2008 <<u>http://en.wikipedia.org/wiki/Service-oriented architecture></u>.
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- 3. *Google App Engine*. (n.d.). Retrieved July 16, 2010, from Google: http://code.google.com/appengine/
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- 7. *VMware and SAP Virtualization, Run SAP Software Virtual to Reduce IT Costs.* (n.d.). Retrieved July 16, 2010, from VMware: http://www.vmware.com/solutions/business-critical-apps/sap/

ANSWERS TO END-OF-CHAPTER REVIEW QUESTIONS:

1. What is necessary for the ERP implementation to be successful?

Enterprise system architecture takes the functions of an organization into consideration to define the necessary ERP modules, as well as the physical components such as hardware, software, and networks necessary to operate the ERP system.

2. What is ERP system architecture?

It's a methodology of separating the components of an ERP system into tiers or layers that make it easier to manage and provide scalability/flexibility.

3. Why is it important to have good enterprise system architecture?

Because it explains the relationships between complex information systems components such as hardware and software, with complex organizational components such as business functions, processes, and people. Without both, there is not a complete understanding of the system and therefore, it will fail.

4. What is the role of architecture in ERP implementation?

To provide support for the various business functions such as accounting, human resources, inventory, etc.

5. List 5 of the major functional modules of ERP.

Self-services, performance management, financials, procurement and logistics execution, and product development and manufacturing.

6. Discuss the different types of ERP architectures.

Two-tier: server handles application and database duties. Clients are responsible for presenting the data and passing input back to the server.

Three-tier: application, database, and presentation are separated into layers that communicate with each other.

N-tier: any number of tiers defined in an architecture.

Web Services: splitting the presentation tier in two additional layers, Web Services and Web Brower.

SOA (Service Oriented Architecture): object-oriented architecture that can extend beyond the corporate firewall onto the web.

Two-Tier		Three-Tier	
Benefits	Limitations	Benefits	Limitations
Easy to use	Inflexible for growth	Can scale well	Higher infratructure costs
Low infrastructure costs	Requires expensive middleware	More reliable	Complex
High-performing small workgroups	Changes in database affect application	Flexible to changes	
	Proprietary restrictions	Lower support and maintenance costs	
	Limited flexibility	Able to reuse components	
		More secure	

7. List benefits and limitations of one ERP architecture.

8. What is Service Oriented Architecture and how is it different from Web Services architecture?

SOA is object-oriented architecture that can extend beyond the corporate firewall onto the web and is more of a software development methodology that is independent of technology than an application, such as Web Services that use specific technologies, such as SOAP or XML.

9. What are the key benefits and limitations of systems integration?

Benefits: better data sharing, improved decision making, cost efficiency, less duplication, and necessary for e-commerce, SCM and CRM

Drawbacks: requires initial setup costs, data sharing can create political problems within department and divisions, more security and privacy risks, etc.

10. What is the role of management in designing enterprise systems integration? Management plays a crucial role in e-integration. People involvement and change management are crucial for enterprise integration and without management support this task can become very difficult.

DISCUSSION QUESTIONS

1. Discuss the objective of ERP Implementation at Nestlé USA. Did they achieve these objectives?

Great discussion! I think you guys get the main issue from this case. The project's initial objective or main aim was to use common business processes or standardize, systems and organizational structures across the autonomous divisions within the USA. These common systems across Nestle USA would create savings through group buying power and facilitate data sharing between the subsidiaries.

Nestle achieved its goals, after regrouping and starting again from scratch, with SAP in place, Nestle USA achieved significant **ROI**. The common databases and business processes lead to more trustworthy demand forecasts for the various Nestle products. This also allowed the company to reduce inventory and reduce the redistribution expenses.

2. Refer to the Nestlé Case in the chapter. What problems were faced by Jeri Dunn, CIO and what do you think would be the right systems architecture for Nestlé?

Dunn was faced with having to change the way Nestle USA did business and facing employee resistance to the new business process he tried to push through. He assembled a team of stakeholders that did not have a stake in the new processes. He had a lack of communications with employees about future changes and was thinking to much about the system architecture and not enough about implementation across the board. For Dunn, a Web-based architecture system would likely be most appropriate. His company is big, to say the least, has thousands of employees and is spread many miles apart. His company has many different products, and many different subsidiaries or corporate partners. Dunn needs something that is easy to integrate with existing internal systems and external trading partners. In other words Dunn needs an Internet platform which can provide a wide range of end users with access to ERP applications over many different locations through the net. Because his employees initially resisted the change, he should also look to make the integration easy to learn and adjust too, and most people are comfortable with Web based platforms.

As stated before, Dunn's main problem was trying to integrate "seven separate companies" onto one main system. Since the products that Nestle sells are not related, it was extremely hard to get everything in sync.

It is said that Dunn knew the technology very well and her main goal was to have data sharing to enable group buying in return reducing costs.

"Dunn actually knew Nestlé technology unusually well because of her long history with the company. In 1991, as associate director for application systems at Nestlé-owned Stouffer's Hotels, she was sent to Switzerland to participate in an effort to establish a common worldwide methodology for Nestlé projects. In 1995, she was promoted to assistant vice president of technology and standards for Nestlé SA, and while there came to understand and agree with the value of establishing common systems throughout global Nestlé because such a change would enable group buying which in turn would reduce costs. Dunn also realized that common systems would facilitate data sharing among subsidiaries. When she was moved to Nestlé USA in 1997 at age 42, she found that her earlier recommendations from Vevey were mostly ignored. "My team could name the standards," Dunn said, "but the implementation rollout was at the whim of the businesses."

3. Discuss the benefits and limitations of ERP implementation at Nestlé USA.

The benefits at Nestlé and many other organizations are as follows:

- Integration of customers, suppliers, and partners;
- Improvement of customer and business partner satisfaction;
- Establishment of a Global Asset Recovery Services brand;
- Reduction of administrative costs;
- Raised productivity;
- Lowered IT operations and systems maintenance costs; and
- Enhanced security and business controls.

Nestlé's new system integrated the extended enterprise and linked all offices in all locations. It transformed a geographically dispersed organization with independent systems into one virtual company capable of competing in an e-business environment through the next decade and beyond.

System Limitations

- The data conversion and transformation from the old to new system was an extremely tedious and complex process.
- Consolidation of IT hardware, software and people resources was cumbersome and difficult to attain.
- Retraining of IT staff and personnel to the new ERP system caused resistance and reduced productivity over a period of time.
- Complexity of installing, configuring and maintaining the system increased thereby requiring specialized IT staff, hardware, network, and software resources.

Business Limitations

- The change of business roles and department boundaries created upheaval and resistance to the new system.
- Retraining of all employees with the new system became costly and time consuming.
- Nestlé incurred high initial costs of purchasing software, consultant costs and disrupting the work flow of its employees

4. Why should ERP architecture include a discussion on organization structure, business process and people, instead of just information technology and systems?

As discussed on this thread, technology should not be the only focus in ERP implementations. It is necessary to focus on business process architecture, business requirements, budget, project management, commitments from top management, and continuous communication with employees informing them about future changes. A systems value is determined by its usage or end-users!

If the **ERP** software is installed with a focus only on the system architecture, you may have a successful installation of software but an unsuccessful implementation. ERP implementation isn't just about the software. It's easy to install a new system. The hard part is changing the business processes of the people who will use the system. Nobody likes process change, particularly when they do not know what is coming. This makes it even more important, and indeed necessary to include a discussion on organization structure, business process and people, instead of just information technology and systems.

5. Why is server-centric architecture better than client-centric architecture?

Great discussion - one is not good and other bad. It all depends on your corp strategy, people skills and culture!

<u>In server-centric environments</u> clients only need access to the Internet and a standard browser like Internet Explorer or Firefox with a few plug-ins like Java Virtual Machine and others. There are no other user interface applications required on the client. Thus, the client can use any Internet device that uses standard Internet technologies such as **Hypertext Transport Protocol (HTTP), Hypertext Markup Language (HTML)** for user access or **eXtended Markup Language (XML)** for back-end communication between an application and third-party system with the Internet Application Server.

<u>In client-centric environments</u> client devices will need installation of **Software Development Kits (SDKs)** and proper configuration and integration with the client device for the application to work properly. However, client-centric platforms are popular in other devices like **Personal Digital Assistants (PDAs)**, Blackberry, and Mobile phones that are increasingly used to access information from the enterprise systems.

6. Discuss the benefits of Service Oriented Architecture over the traditional three-tier architectures.

In general, SOA allows for more flexibility, scalability and reusability than do the traditional architectures. It reduces cost, accelerates movement, and provides a data bridge --- these are some of the short term benefits. A major longer term benefit is that it provides flexibility that the traditional systems do not have by providing services anywhere on any system or network.

Benefits:

Business-level software services across heterogeneous platforms Complete location independence of business logic Services can exist in any system and network Loose coupling across application services Granular authentication and authorization support at service unit level Dynamic search and connectivity to other services

Short-term benefits: Enhanced reliability Reduced hardware acquisition costs Leveraged development skills Accelerated movement to standards-based server and application consolidation Provide a data bridge between incompatible technologies

Long-term benefits: Provides the ability to build composite applications Creates a self-healing infrastructure that reduces costs Provides a real-time decision making application Enables the compilation of a unified taxonomy of information across an enterprise and its customers and partners

Business Value benefits: Meet customer demands faster Cheaper acquisition and maintenance of technology Empowers the management of business functionality Leverages existing investments Reduces reliance on expensive custom development

Limitations: Inconsistent performance Requires enterprise-level focus for implementation to be successful Security system has to be sophisticated Costs can be high due to services being junked often

WIPRO & MHB CASE STUDY QUESTIONS

1. Compare and contrast the self-service implementation between Wipro and MHB. According to you, which company did a better job? Explain.

Wipro's implementation goals were achieved based on a proven methodology that analyzed the organization and employees needs. The implementation success factors were the focus of the company and its employees. The MHB implementation was primarily focused on the technology and how to implement self-service to employees and link it to existing back office processes. Who did a better job depends on what you think is important. Wipro did

2. Are the measures used by Wipro (i.e. costs, returns, and cycle time) appropriate for evaluating their self-service implementation?

These measures are just one means of evaluating the success of the self-service implementation. Other intrinsic success factors include collaboration, budget, CEO commitment, strategic planning, re-engineering, marketing-employee communications, corporate standards for technology solutions, business case, anytime anyplace access, consistent look and feel and consistent interface across media.

3. What would happen to the self-service implementation at MBH if the company decided to adapt the SOA model? Does self-service implementation make it easier or more difficult to implement SOA? Explain.

Using an SOA model at MBH would become increasingly more difficult to implement. With different back office systems the sharing objects will be increasingly complex and difficult to maintain to remain current and competitive.

CHAPTER 4: DEVELOPMENT LIFE CYCLE

CHAPTER OBJECTIVES

- Review the System Development Life Cycle (SDLC)
- Examine the problems and alternatives with SDLC
- Know the key issues in ERP implementation strategy
- Understand ERP Implementation Life Cycle
- Examine the rapid implementation methodologies
- Compare and contrast SDLC and ERP Life Cycles
- Examine the role of people like top management, consultants, and subject matter experts (SMEs) in ERP Life Cycle
- Understand the importance of the project management office and the project organization to a successful ERP implementation.
- Know the components of a project organization and the roles and responsibilities of each.

CHAPTER OUTLINE

- I. Opening Case: Of Men and Mice: An ERP Case Study
- II. Preview
- **III.** System Development Life Cycle
 - a) Traditional SDLC
 - b) Rapid SDLC Approaches
- **IV.** ERP Implementation Life Cycle
 - a) ERP Implementation Plan
 - b) ERP Implementation Methodology
 - c) Traditional ERP Life Cycle
 - d) Rapid ERP Life Cycle
 - e) ERP Life Cycle Vs. SDLC
- V. Project Management
 - a) Project Roles and Responsibilities
- VI. Implications for Management
- **VII.** Chapter Summary
- VIII. Real World Case: Two Short Cases: OilCO & ExploreCO

CHAPTER OVERVIEW

This chapter discusses the challenges in the ERP system development process. The opening case at the beginning of the chapter is on Jackson Laboratory located in Bar Harbor, Maine. They had to deal with the problem of customization while implementing Oracle's ERP system. Jackson was able to implement their ERP very close to its \$5 million budget and only six

months longer than its one year goal. The case presents interesting issues on how organizations have to be alert and aggressive in order to achieve their implementation goals.

The traditional information system development process is called the system development life cycle (SDLC). Traditional SDLC included five phases: investigation, analysis, design, implementation, and maintenance. The investigation phase checks if the new system is feasible. It also checks the costs associated with the system. The analysis phase determines the user requirements for the system. The design phase produces the technical specifications for the system. The implementation phase starts with gathering the tools and hardware needed to put the system into motion. This includes any testing and training needed to put the system into operation. The key limitation of the SDLC process is that it is not quick and easy to develop a new system. Sometimes by the time it is developed, it has become outdated. Recruiting a development team is costly, so that makes SDLC very expensive. Also, not all information systems require SDLC. Some smaller applications do not need SDLC.

Quicker and less expensive short cuts for this process are called Rapid SDLC approaches. Prototyping is one such Rapid SDLC approach. This approach skips the analysis and design phase; instead it implements a prototype of the actual system using fake data. This is to see if it generates the wanted results as soon as possible. Another approach is End-User development, which lets end-users create their own applications. In this approach, the end-users are trained to develop custom applications.

An ERP implementation plan provides the clear path of the implementation process. It sees the costs, scope, and time restraints of the application. There are three choices: First, is a *comprehensive* ERP integration plan, which is the most expensive and time-consuming plan. It involves making sure that the implementation has full functionality. It also involves a high level of Business Process Reengineering. Second, is the *middle-of-the-road* ERP implementation plan. This is exactly how it sounds; it is not as expensive or extensive as the comprehensive plan, but it is not as clear-cut as the next plan. Third, is the *vanilla* ERP implementation plan, which basically aligns the business processes to the ERP system and minimizes reengineering. Several ERP implementation methodologies are available from vendors to make the life cycle more efficient.

The ERP implementation life cycle varies from the traditional SDLC in that it adapts to the package-driven approach, since the systems are not developed from the ground up; rather, the ERP package must be configured or customized for the organization. The ERPLC process like its counterpart SDLC has an outcome at the end of each stage. The first stage is the *scope and commitment stage*. It is similar to the investigation stage of the SDLC. Different scopes are looked at and decisions are made based on these analyses. The second stage is the *analysis and design stage*. One main part in this stage is to check the differences in the current business process and the process in the ERP software. The next stage is the *acquisition and development stage*. The entire platform is configured and built. The fourth stage is the *implementation stage*. The system is released to end-users and the usage is monitored. The final stage is the *operation stage*. This stage includes any training needed or patches that are needed for the system.

ERP implementation requires application of good project management approaches for efficient and effective organization of the various teams. Besides the balancing of project triangle with proper scope, adequate resource allocation and time management, the project management office must provide a detailed project organization chart (see Figure 4-8). This organization structure must be aligned with good project governance consisting of owners to the various teams. If these committees and teams are assigned proper roles and responsibilities, the chances of project success increases. Good project management follows this up with evaluation of the teams' achievements.

The case study at the end of the chapter discusses ERP implementation at two oil companies—OilCO and ExploreCO—in Australia. The names of these companies are anonymized to maintain their privacy. The first company, OilCO, is a refiner and marketer of petroleum products in eleven companies in the Pacific. OilCO wanted a system that will achieve full process integration and automation. They wanted to improve their customer service and expedite a restructuring of the business plan. OilCO selected a mainframe-based ERP, the biggest in the world, with 1600 users in Australia, New Zealand and the Pacific islands, processing 25,000 to 35,000 transactions per hour, and over 1,000 orders per day. The implementation was completed over the planned budget, taking longer than expected.

The second company, ExploreCO, is an oil and gas exploration and production company. They are based in the southwest of Australia and are an affiliate of OilCO. ExploreCO had to decide whether to upgrade their existing system or replace it with a new one. They chose to replace it with a new system and performed a feasibility analysis of several ERP systems. The implementation was completed on time and within budget.

Comparing the two companies, one can see how the changes in strategy impacted the final outcome. ExploreCO learned from the implementation of OilCO, applying the lesson in their project implementation. ExploreCO also used experienced project managers and workers, something OilCO failed to do. Also, ExploreCO needed to align their new system with OilCO's system, and since it was already in place, it was easier for ExploreCO to follow the lead.

ADDITIONAL RELATED INFORMATION

- 1. Wikipedia—System Development Life Cycle http://en.wikipedia.org/wiki/Systems_Development_Life_Cycle
- 2. The Department of Justice Systems Development Life Cycle Guidance Document http://www.usdoj.gov/jmd/irm/lifecycle/table.htm

ANSWERS TO END-OF-CHAPTER REVIEW QUESTIONS

1. What is the role of systems approach in the SDLC?

Systems approach is used for problem solving. This approach takes complex problems and breaks them down into small manageable problems. It identifies problems from the top-down

and then solutions are derived from the bottom-up.

2. Briefly discuss the key phases of the SDLC methodology.

Traditional SDLC included five phases. The investigation phase checks if the new system is feasible. It also checks the costs associated with the system. The analysis phase determines the user requirements for the system. The design phase produces the technical specifications for the system. The implementation phase gathers the tools and hardware needed to put the system into motion. This includes any testing and training needed to put the system into operation. The final stage is the operation stage which includes the implementation of needed training or patches for the system.

3. Discuss the alternatives approaches of SDLC and the benefits of alternatives.

One alternative is prototyping. This approach skips the analysis and design phase; instead it implements a prototype of the actual system using fake data to see if it generates the wanted results as soon as possible. Another alternative is end-user development, which lets end-users create their own applications. In this approach, the end-users are trained to develop custom applications.

4. Compare and contrast the three major ERP implementation categories.

The first is a comprehensive ERP integration plan which is the most expensive and time consuming plan. It involves making sure that the implementation has full functionality. It also involves a high level of Business Process Reengineering. The second plan is called the middle-of-the-road ERP implementation plan. It is not as expensive or extensive as the comprehensive plan, but it is not as clear-cut as the vanilla plan. It also involves a high level of BPR. The last plan is called the vanilla ERP implementation plan. It basically aligns the business processes to the ERP system and minimizes reengineering.

5. What is ERP implementation methodology? Give Examples.

This refers to a well thought-out approach to solving a business problem. Some examples are Total Solution, FastTrack, Rapid-Re, ASAP, BIM.

6. List the major tasks in the scope and commitment phase of ERP life cycle?

- 1. Gap Analysis what functions are necessary and can your operation handle it.
- 2. Physical Scope geographic location of the sites and the number of users.
- 3. BRP Scope what is happening to the current process (changing or ending).
- 4. Technical Scope how much the software it changing and will it be customized.
- 5. Resource Scope time and money needed for the project.
- 6. Implementation Scope how should it be implemented (phase, pilot, parallel, big bang).

7. List the major tasks in the analysis and design phase of ERP life cycle?

- 1. User Requirements
- 2. Differences between current business process and the embedded process in the ERP software
- 3. Data Conversion, System Conversion, and Training
- 4. Execution Plan for the new system release
- 5. Prototype of the ERP software

8. List the major tasks in the acquisition and development phase of ERP life cycle?

- 1. Purchase license for production version of the software.
- 2. Configure platform with hardware, network, security, software, database, and real production data.
- 3. Customize of embedded rules, data in the tables, input screens, and reports.
- 4. Migrate data from old to new system.
- 5. Configure ERP system with proper security.

9. What is the role of change management in the ERP life cycle?

Using the gap analysis, the team must develop a design that includes a change management plan. This must be detailed with an execution strategy for the release of the new system. This team must work with the end users on implementing the changes in business processes with the prototype version of the software. Change management is also part of the implementation stage to smoothen the transition. When it gets to the operation stage, the team carefully monitors user feedback from training to make necessary adjustments to the change management approach.

10. List the major differences between ERP life cycle and SDLC.

- 1. In SDLC the new application is made for the user requirements. In ERP life cycle the business process must be changed to fit the best practices of the ERP software.
- 2. In SDLC consultants are limited to IT hardware, software, and training. In ERP life cycle consultants are important from beginning to end in advising the organization on software selection, reengineering of business process, and software installation and change management.
- 3. In ERP life-cycle software is selected very early in the implementation process. In SDLC it is not brought up until the forth stage.

DISCUSSION QUESTIONS

1. Is a surety bond an effective means to establish true accountability for IT implementation, as presented in the Jackson Lab case?

Surety bonds are only great for contract lawyers because they always end up entrenched with hundreds of thousands of dollars of litigation. The surety (the party who ensures the Jackson Lab will get what it bargained for) always disputes a claim filed by the principle (the principle in the case is Jackson Lab) for the full penal sum. Disputes come because

the principle always feels it did not get what it bargained for and sees surety bond claims as a way to either make an extra profit, or never lose. However, in Jackson Lab's case (as with all IT industry bonds) insufficient commonality and standardization in IT projects and bonds result in even more than normal litigation. Also, unless the project has simple, clear, easily identified, and understood benchmarks, those who contract for a surety bonds will never truly understand what they contracted for (the result in the complex litigation docket). Surety bonds only work with clear identifiable project goals, and in the IT industry unlike other industries (e.g. fiduciary duty type pension plan management / investment), goals may be difficult to quantify and articulate before a contract is written. As far as pure accountability for IT implementation is concerned, surety bonds hurt, because the party building the system knows that a surety bond is between them and a lawsuit. In other words the party that needs to be accountable to Jackson Lab for its IT implementation will have much less worry about doing a good job because if they are sued a surety bond will step in. It also provides disincentive to employees of Jackson Lab to fully immerse and commit themselves to making the ERP project successful.

2. Was the phased implementation a good approach for an organization like Jackson Lab that deploys an ERP solution for the first time? Would it allow focus on a key/critical area, stabilization of the system usage and quicker visible benefits?

With all of the strategies taken by Jackson Lab to reduce risk they went with a phased approach. Phasing out the new ERP system allowed the core team to focus their training on certain employees and specific functionally areas of the company. It also allowed "kinks" in the system to be realized and resolved before the entire company was up and running.

There is also less resistance from employees when the live is phased because the core team is able to offer more support and focus attention on the areas going live. This allows for the new system to get a good "reputation" among other employees who know they will need to go up in the future with the product.

A phased implementation was the correct approach. This was a good decision because this was the first time Jackson Lab had been through an ERP implementation process. A big-bang approach could have severely disrupted the flow of every day work even more than the phased did when the brightest employees were taken. The phased approach allowed for a focus on training and the installation of the ERP system, as barely anyone had experience dealing with this sort of process.

3. What do you think about the modifications in a unique business process at the Jackson Lab like raising and distributing the mice?

The biggest challenge for Jackson Lab was the modification of Oracle Process Manufacturing (OPM) module to accommodate the lab's unique business processes of raising and distributing mice. However, the OPM module was designed for companies that mix ingredients together to produce products like bread or beer; not for a lab environment.

Indeed the biggest challenge is yet to come. In the event an update is needed, installing a newer version of the system will not go smoothly—in fact it will be a problem. That is why the chocolate approach is not recommended. Usually a phased implementation approach and continuous improvement efforts will require ongoing time commitments. Employee turnover and job rotation will also require ongoing training efforts. The nature of the ERP software package (and associated system software and hardware) typically mandates the number and expertise of MIS personnel needed for ongoing support. The short timeframe involved in the Jackson Lab implementation prevented much of this concern, otherwise it could have been a nightmare.

4. Discuss the risks and benefits of going for a big-bang conversion versus using the phased or parallel approaches.

The big bang implementation strategy converts from the old to new system within a relatively shorter period of time than if the project were phased or parallel. The benefits are simplicity and lower implementation costs. It also condenses the pain and difficulty of an ERP project into a shorter period of time, although sometimes the pain can be more pronounced, if things go wrong. The risks of the big bang implementation approach is that the project is often rushed, details are overlooked, and changes to business processes may not be the best ones for the organization.

The phased approach is done either be by functional business area or geography. The benefit here is that is allows project teams to take their time in the planning, customization, and testing of the system while continuing with day-to-day jobs. The risks are that these types of phased projects often lack the urgency and focus of a big-bang project. It can also lead to "change fatigue," which can cause employees to become burned out on constant change. Instead of getting the project over with in a shorter period of time, these projects involve constant change over longer periods, which can be draining to employees.

The parallel approach is done by transferring between an old IT system to a target IT system in an organization. In order to reduce risk, the old and new system run simultaneously for some period of time after which, if the criteria for the new system are met, the old system is disabled. The process requires careful planning and control and a significant investment in labor hours, and system resources.

All three approaches have their clear pros and cons. However, it is important to find what works best for your organization. Implementation schedules need to be aggressive, but not to the extent that they cause you to overlook important details or make sub-par decisions. It is often helpful to do the project in multiple (but aggressive) phases to help focus the organization and create a sense of urgency. These details should be carefully outlined as part of your ERP Project Planning Approach

5. How should organizations approach the change management strategy to manage their people problems that usually cause many mishaps and are the main reason of failure in ERP implementation project?

A change management strategy means helping employees see the value of change. ERP Implementations and Change Management Strategy share several of the same key components—each must have a vision that identifies the desired future state. A Change Management Roadmap needs to be developed that provides a cost effective strategy to prepare all employees for a change.

An organizational impact analysis needs to be developed that can assess how the changes will impact specific employees and the organization as a whole. This is coupled with customized training and ongoing support for the employees to learn the new processes, tools, roles, and responsibilities. Finally, there needs to be leadership and a communication strategy that brings integration and sustainability into the process.

The keys to change management are

1. A clear communication plan outlining how change will be communicated

2. A plan for involving all stakeholders and those affected by the change so that expectations of the implementation can be clearly communicated

3. A clear definition of change.

The communication plan defines requirements for status reports (weekly or monthly or as necessary) that communicate change and the required activity of the change. The activity may involve IT support and SME support.

Setting expectations involves communication of what will be involved and required of the individuals who are affected by the implementation. It will serve to generate consensus and participation among those who will make or break the implementation.

The final step is to define what a change is. Is change a requirement that we forgot and now need to include in a business process, is it a requirement that we define but was not understood or correct like a hardware server not adequate to support the required function?

These three things will help to keep staff up to date and on board with the changes that arise throughout an implementation

6. Pick any two rapid implementation methodologies of ERP. Discuss the benefits and limitations of each in a table format.

		Accelerated SAP	
Total Solution	Rapid Re	(ASAP)	Benefits/Limitations

Ernst & Young	Gateway	SAP	
1 - The Value Proposition build business case for ERP solution	Stage 1 – Preparation Mobilize, organize, and energize those performing reengineering project	Phase 1 – Project Preparation Planning and assigning organizational readiness	TS examines business case where RR and AS have already assumed it RR & SAP seem more technical less "touchie feelie" than TS
2 - Reality Check Assessing the organization's readiness for change	Stage 2 – Identification Develop customer- oriented process model for the business	Phase 2 – Business Blueprint Develop visual model for the business' future desired future state based on toolkit of predefined options	RR & AS are changing and defining processes. RR seems more tailored to the specific business where AS starts with generic toolkit and then focuses on specific may be left with generic BR.
3 - Aligned Approach Setting expectations that deliver long & short-term value	Stage 3 – Vision Select processes to reengineer Formulate redesign options for breakthrough performance	Phase 3 – Realization Configure R/3 system 1.) config baseline sys 2.) fine tune to meet all business process requirements	RR begin selection of system to design and reengineering. TS defines modules that would allow for a phased approach. AS is actually configuring a base system that can be up and running in little time
4 - Success Dimension right blend of people, skills, methods and management team	Stage 4 – Solution Define technical & social reqs. For new processes Develop detailed implementation plan	Phase 4 – Final Preparation R/3 system fine tuned Adjustments made to system and business to prepare for start-up Fine sys tests and training	AS is fine tuning the toolbox where RR is defining resource requirements. AS has rubber on the road more quickly. TS focuses only on the team
5 - Delivering Value Measure results and celebrate success	Stage 5 – Transformation Implement implementation plans	Phase 5 – Go Live and Support Measure benefits of R/3 implementation on-going basis	TS measures implementation results. RR moves from implementation to production. AS is production and supporting the system.

7. What do you think should be the role of consultants in the ERP life cycle? Explain.

If an organization does not have experience in the ERP life cycle it should look seriously at hiring a consulting company as an implementation partner to assist and possibly lead the organization through the implementation. However, if they have experience, consultants should only be needed to address gap skills.
Consultants play an important role in rapid implementation of ERP systems. Rapid or accelerated implementation approaches are very popular and require the use of experienced consultants to leverage the knowledge of techniques that have worked well with other organization. This involves the use of scripts and wizards developed by consulting firms. These tools can help automate some of the more common tasks that occur during an implementation. Some of the tasks that can be accelerated are as follows: migration of data, identification of duplicate data, and other standard tasks.

8. Discuss why top management support and involvement is important for the ERP life cycle.

As more and more companies are turning towards ERP systems to improve their overall business operations, it is vital of senior management to be on board with ERP. ERP, when used effectively, can be a vital tool for senior management by helping management capture the necessary data across all major business functions. Having just one platform that can capture all of the pertinent information allows for top management to easily comprehend the current state of the business, what is working well, where improvements need to be made, etc. It is vital for top management to support and be active within an ERP system during the ERP's life cycle in order to guarantee the success of the ERP System. If top management is not attuned to the functionality of the ERP System, the system stands little chance of being successful within the organization. Management may decide to take the company in a direction that may not be easily adaptable to the ERP system that is in place, or senior management's lack of support for the system could very well cause a trickle down effect. Senior management to distance themselves, which then causes Sugervisors to distance themselves, eventually causing the system to fail.

CASE STUDY QUESTIONS: OILCO AND EXPLORECO

1. Compare and contrast the implementation of OilCO and ExploreCO. What were the similarities and differences between the two implementations?

Similarities include: Adoption of critical success factors, minimal modification of software and major changes to business processes to achieve goals.

ExploreCO	OilCo
An identified project champion for that was	Had a champion but never fully identified
there throughout the project.	or engaged in the project nor was it the
	same person throughout the project
Very focused implementation	Very large ERP implementation and
	included the development of a module
	specific to Oil industry
Hands on approach to implementation by	Lack continuity with the champion
the project champion	
Best people full time on the project	Not the best staff on the project
Strong project management and adherence	Less strong project management and little
to deliverable dates	adherence to deliverable dates.

Differences include:

2. Why do you think the projects were successful? Was it the articulation of CSFs? Was it their strategy of minimal customization? Or something else? Explain.

Both projects were ultimately successful in that senior management was committed, a governance structure was in place and the critical success factors were documented and understood. ExploreCO adhered to the scope much better than OilCo.

3. What can we learn from this case? Also, provide suggestions for improvement.

Project champions are key to delivering a project on time. Governance along with decision making at the project level are key to meeting deadlines. In the case of OilCo the lack of good decision makers on the project that were focused on the deliverable caused for a significant delay in the implementation.

CHAPTER 5: IMPLEMENTATION STRATEGIES

CHAPTER OBJECTIVES:

- Acquire a greater knowledge base of ERP components and how they work together to support business.
- Learn why third party products are needed to operationally round out ERP system functionality and the issues involved in using them.
- Appreciate the impact of an ERP implementation on platform components such as data security, system reliability and sustainability.
- Understand implementation approaches, the differences between vanilla (minimal or no system modifications) and chocolate (modifying the system) implementations and the short-term and long-term impacts on the system and company.

CHAPTER OUTLINE:

- I Learning Objectives
- II Opening Case: Aquatech International Corporation
- III Chapter Preview
- **IV** ERP Components
 - a) Hardware
 - b) Software
 - c) People Resources
- V Third Party Products
 - a) What are they and Why Are They Needed?
 - b) Impacts of Integration with ERP
 - c) Support
 - d) Overcoming Third-Party Integration Issues
 - e) Middleware
- VI Database Requirements
 - a) Understanding Transactional and Reporting Needs
 - b) Selecting The Database
 - c) Staffing and Database Administration
- VII ERP Approaches
 - a) Governance
 - b) Implementation Methodology
 - c) What is a Vanilla Implementation?
 - d) Why Would You Consider a Vanilla Implementation?
 - e) When Should You Consider Modifying an ERP?
 - f) Benefits and Drawbacks
- **VIII** ERP Implementation Examples
- **IX** Platform Issues
 - a) Servers

- b) Network
- c) Security
- d) Disaster Recovery and Business Continuity
- **X** Implications for Management
- XI Chapter Summary
- **XII** Review Questions
- **XIII** Discussion Questions
- **XIV** Exercises
- **XV** Real-World Case: United States Army

CHAPTER OVERVIEW:

The beginning of Chapter 5 deals with ERP components and the use of third-party products for an ERP system. The middle of the chapter is concerned with assessing database requirements and determining which ERP approach and implementation to use. The rest of the chapter goes over implementation examples, platform issues, implications for management, and risk management. Overall, what you get out of this chapter is a sense of what an ERP actually is and the importance of selecting the correct software and implementation strategy while properly managing risk to ensure the project accomplishes business goals and stays within established tolerances for time, budget, etc.

The three components that compose an ERP system are hardware, software, and people resources. The hardware component consists of all the physical hardware used by an ERP, such as server computers, client computers, and various computer peripherals. The software component is composed of three key types of software: system software, application software, and database management system software. These software systems are responsible for providing specialized interfaces between the end-user and the computer hardware so that the end-user can manipulate the computer to perform desired tasks. The people resources simply consist of end-users, IT specialists, a project manager, ERP implementation team—basically any persons who utilize the ERP system.

Third-party products are also very important to ERP implementation as they fill in gaps in desired functionality and ensure the ERP system can perform all desired and required tasks. Third-party products can either be interfaced or integrated with the ERP system, but this decision will have a large impact on the overall implementation and must be given much consideration. Usually some form of middleware is created to assist this process. Integration will share all data and data elements with the ERP system with no data redundancy, but this means building it directly into the ERP. Interfacing is easier to implement, but information will only flow in one direction and updating will be slow and often with data redundancy. "It is important for companies to be sure they choose the right software. Third-party software vendors can be used as strategic partners and provide quality advice and service." ERP vendors will often have a list of their strategic partners that they work with involving third-party software, so companies should keep this in mind when dealing with their ERP vendor.

Another important aspect of ERP planning involves understanding the database requirements. The two main types of databases a company will need are transactional and reporting. A transactional database allows for quick data entry and retrieval on an individual scale. A reporting database is like a warehouse that holds all of the information of a company and is fed data periodically from transactional databases. A reporting database is used to

generate specialized reports that a transactional database is likely incapable of doing. The most important part of this process is selecting the right database. A company needs to take into consideration the availability of software applications that will use the selected database, the availability of a knowledgeable technical staff, and if the overall functionality of the database will satisfy the company's needs. The company will then need to address the need for staffing and database administration. If the company has sufficient internal resources and trained professionals, then it need not worry. However, if sufficiently trained personnel do not exist, then a company either needs to look to hire new staff or outsource its administration.

The final portion of the chapter talks about approaches to successfully implement an ERP system. Governance is a critical component that ensures proper leadership is identified and holds those in management positions accountable for making sure that decisions are based on developed strategies with a clear direction. Everyone involved must understand and accept the governance structure from the very beginning so that any problems, concerns, decision making, etc, is all submitted through the proper channels so that everyone knows what is going on and managers can keep track of everything. Some governance roles include owners, a project executive, a steering committee, an application steward, a chairperson, project management office, project teams, project team leads, and cross-functional teams. All of these people or groups have specific roles that allow them to facilitate ERP implementation in an organized and efficient manner, and also provide a sound hierarchy of leadership.

When selecting an ERP a company must have a clear understanding of its implementation methodology choices, as these choices will affect what software they purchase, how it will be used, and who will ultimately support it. The importance of choosing the right methodology will affect the entire implementation process as it will ensure deadlines are met, budgets remain on target, and functionality yields desired outputs. The three key methodologies are comprehensive, middle-of-the-road, and vanilla. Comprehensive means full customization of the ERP and yields the greatest control over desired functionality, but is expansive, lengthy, costly, requires significant BPR, and often sacrifices vendor support. Vanilla, on the other hand, means simply implementing an ERP as is, without any modification. This saves the most time, money, and retains full vendor support. Business processes are aligned to serve the ERP software rather than modifying the software to serve current business processes. Middle-of-theroad strategy is somewhere in between the two extremes. The importance is recognizing when it is appropriate to use a particular methodology.

There are benefits and drawbacks to each methodology, which ultimately express themselves on the balance sheet. If a company is inexperienced or lacks a highly trained technical staff, then it will want to use a vanilla approach to avoid complications and to retain full vendor support. Choosing to customize is very risky as upgrades become cumbersome and lengthy, if not impossible. ERP implementation is a high-risk venture no matter what you do; yet it can yield tremendous benefits that often far outweigh those risks

The implications for management revolve around making sound business decisions regarding ERP selection, implementation, governance, and methodology. If management can incorporate these aspects into implementation and keep a close connection with the project, then the chances for success exponentially increase. Choosing the right methodology and determining whether or not to customize the system will ultimately determine the complexity and feasibility of the project, as will communicating this to everyone involved and maintaining unanimous direction.

ADDITIONAL INFORMATION:

- 1. <u>http://databases.about.com/od/administration/a/softwareoptions.htm</u> (Mike Chapple, "Database Software Options," from About.com: Databases).
- 2. <u>http://en.wikipedia.org/wiki/List_of_ERP_vendors</u> ("List of ERP Vendors," from Wikipedia).
- 3. <u>http://sysoptima.com/erp/implementation_methodologies.php</u> ("ERP Implementation Methodologies," from sysoptima.com).
- 4. <u>http://connect.educause.edu/Library/EDUCAUSE+Quarterly/ASecurityChecklistforE</u> <u>RPI/45535?time=1207070225</u> (Joy R. Hughes, Robert Beer, "A Security Checklist for ERP Implementations," from Educause Quarterly).
- 5. <u>http://www.eweek.com/c/a/Supply-Chain-Management-and-Logistics/Microsoft-ERP-Users-Buy-ThirdParty-SCM-Software/</u> (Jacqueline Emigh, "Microsoft ERP Users Buy Third-Party SCM Software," from eWeek.com).
- 6. <u>http://findarticles.com/p/articles/mi_m0CGN/is_n186/ai_21154432</u> ("Third Party Vendors Show Off R/3 ERP Products," from Computergram International).
- 7. <u>http://www.msc-inc.net/ERP_Implementation.htm</u> (Skip Stein, "Impact on ERP System Implementation," from Management Systems Consulting, Inc.).
- 8. <u>http://sysoptima.com/erp/erp_definition.php</u> (Dr. Bruce Zhang, "ERP Definition A Systems Perspective," from sysoptima.com).
- 9. <u>http://www.saleslobby.com/OnlineMagazine/1100/features_SCiszewski.asp</u> (Sunil Ciszewski, "A Common View of the Customer: ERP, Best-of-Breed, or eCRM," from The Alexander Group, Inc.).

ANSWERS TO END-OF-CHAPTER REVIEW QUESTIONS

1. What are the components of an ERP system?

The three components are hardware, software, and people. Hardware consists of computer devices and peripherals that will be used by an ERP system. Software is usually the ERP applications, and other necessary applications to allow the ERP software to function, and is the tool necessary for building the system.

2. Why would a company choose to implement an ERP?

The choice for a company to implement an ERP is based upon its desired operational and functional capacity compared to its current limitations from existing systems. A company would choose to implement an ERP after a careful determination of business inputs, processes, and outputs which they have identified the current system being inadequate to handle, thus requiring an ERP to improve business performance.

3. What are third-party products and why are they needed?

Third-party products consist of software components that provide necessary functionality to the ERP to make the system operational. This could include things like extra modules to support current ERP software or new software components that work in conjunction with, but independently from, the ERP system to ensure operational needs are satisfied.

4. What is an implementation methodology and why is it important in ERP implementations?

Implementation methodology involves identifying requirements from an ERP and modifying the implementation plan to maximize returns in the most efficient way. It is important to choose the right methodology as it will affect the entire implementation process, ensuring deadlines are met, budgets remain on target, and functionality yields desired outputs.

5. What are the pros and cons of implementing a system without customization?

Being able to implement a system without customization yields the most benefits and is the most cost effective solution. The pros of using a Vanilla (non customized) implementation strategy include lower costs, easier and less time consuming upgrades, and retaining full vendor support. The con of this strategy is that a company must choose from "out of the box" processes and functions and have little control over functionality.

6. Why are there differences between a transactional and reporting database?

ERP systems require databases that can provide the quickest data entry and retrieval. A single relational database instance is simply too inefficient for long and short term data storage and retrieval. Therefore, two types of database instances were created: transactional and reporting. Transactional databases handle individual pieces of info for updating or inquiring, while reporting databases import data from transactional ones for long term storage and for producing specialized reports.

DISCUSSION QUESTIONS

1. Governance and methodology are important for ERP implementations; discuss the merits of each and how in the Army they were able to implement each.

Governance: Governance is a structure (such as executive councils and steering committees) that encourages the active participation of leaders in planning and controlling the business use of IT, to include ERP in the Army case. Also, as stated in the text, governance of any major change in an organization is critical to the success of the change effort, but governance of ERP programs is even more critical. The Army addressed this issue by using five transformation considerations, with **sponsorship/leadership** and **stakeholder alignment** at the top of the list. ERPs require sustained leadership, and Army officers often transfer/rotate out. This was addressed by having the departing officer thoroughly engage his/her successor and convey the importance of continued engagement to their successors during transition.

Methodology: Methodology refers to the systematic approach to solving a business problem. The Army used blueprinting methodology. Blueprint is a proven, flexible and scalable process used by ERP teams to successfully implement any large scale ERP. There are various DoD statutory and regulatory rules, which are not accommodated by ERP software, but this does not have to be a barrier to using the delivered ERP functionality. Blueprinting is the methodology of choice because it allows the army to stay within the statutory limitations by using the comprehensive pilots on a live system of proposed business processes using delivered ERP functionality.

2. In addressing ERP implementations the infrastructure needs to be addressed also. Describe the infrastructure components and what is involved in choosing and installing the components

Components of infrastructure include the following:

1) Hardware - Servers, Clients, and Peripherals

2) Software – System Software, Database Management System (DBMS), and Application Software

3) People Resources – End-users, IT specialists, and Project Managers.

In order to properly choose and install these various components the company must first identify and plan exactly what is needed. Without a clear, well thought out direction and focus ERP implementations will not go smoothly leading to over-run costs, employee frustration, and numerous other issues. Also, people with the necessary skill set to install these components must be involved in order to eliminate and/or minimizing mistakes when it comes to integration/implementation of the new components.

Infrastructure components necessary for ERP should provide for available, secure, and reliable operation of the ERP system. Infrastructure components should be selected based on connectivity, network and system bandwidth, security, user load, and back-up and recovery capability.

Major infrastructure components will include servers. These can be selected on ERP vendor input. Servers should be expandable to take care of future capacity and growth demands. Associated with servers is the election of a properly sized database and web servers to assume quick and reliable access to data.

Network infrastructure is another component that is required for a successful implementation. The network should be reliable and secure. Selection can be based on connectivity and speed for end users of the ERP. If the server and database components are outsourced it is usually recommended that the server farm company provide connectivity.

Security software and practice are an aspect of infrastructure necessary to prevent

unauthorized access, to prevent virus infestation of desktop PCs and servers. Software security should be augmented with a good security awareness program with a minimum training requirement for users.

The final piece of infrastructure should be a disaster recovery and business continuity plan. This involves business and senior management. They must identify mission critical transactions and develop a plan to make them available quickly as possible after a disaster.

CASE STUDY QUESTIONS: U.S. ARMY

- 1. What were the key goals in the Army using an ERP system?
 - Common view of the rapidly changing operational environment
 - Eliminate boundaries between One Army and One Enterprise
 - Synchronize transformation between Institutional and Operational Army
 - Optimize the Army at the enterprise level
 - Rapidly affect combat operations by anticipating change and providing decisive and dominant combat capability where and when required
 - Transform the Army from end-to-end
- 2. What were the key implementation considerations that were addressed as part of the planning process, especially related to using an integrated ERP and transforming the culture?
 - **Sponsorship/Leadership** Successful ERP systems require dedicated and engaged leadership. The Army has a unique situation where leaders rotate, and an ERP implementation can span over multiple sponsors.
 - **Stakeholder Alignment** The Army's previous structure did not require each area to work together. There needed to be tradeoffs in each of the areas to have the best overall solution for the organization, so there needed to be decisions made at a higher level than the area that are implementing the tradeoffs.
 - **Cost** Transformation Management (TM) is a key element to the success of the implementation. It must be communicated and accepted by the leadership in advance. Often times when there are cuts to the budget it is the first thing to be cut.
 - **Project Lifecycle** TM needs to be part of the project from the beginning and is key to the overall success of the project.
 - **Culture** As with any organization that has a long term history, change will be a challenge. Leadership must take an active role within the Army to support the change.
 - **Communication** The Army has many areas in which communication is key to success, both internal and external to their organization. A good communication plan must be put into place.

3. How was the change management process incorporated into the implementation?

The Army used blueprinting, which is a comprehensive set of pilots to test proposed changes and ensure that the proposed changes will work as advertised. Additionally, the Army evaluated customization of the software versus changing the process on a regular basis.

4. Discuss the pros and cons to customizing the system?

- Pros The software will better meet the needs of the Army and their unique processes and business processes. Users will not have major changes and therefore adjust to the new system more readily.
- Cons Upgrading to a newer version of the software will be more time consuming and expensive; customizations are not supported by the vendor and customizing can cause delays in the project and possibly destabilize the software.

CHAPTER 6: SOFTWARE AND VENDOR SELECTION

CHAPTER OBJECTIVES

- Understand the initial steps in the process for the successful purchase and implementation of an ERP system.
- Determine the total cost of ownership and what it is to partner with an ERP vendor.
- Understand why the first steps in the purchase of an ERP are critical to the change management process.
- Identify the steps involved in negotiating a contract with a vendor.

CHAPTER OUTLINE

- I. Opening Case: Oracle wins out over SAP at Welch's
- II. Vendor Research
 - a) Short List of Vendors
- III. Matching User Requirements to Features
- IV. Request for Bids
- V. Vendor Analysis and Elimination a) What Does ERP Really Cost?
- VI. Contract Management and License Agreements
- **VII.** Implications for Management
- VIII. Real World Case: Enterprise Solutions for Fruit & Vegetable Beverage Manufacturing

CHAPTER SUMMARY

This chapter discusses the process of selecting a vendor for ERP implementation. The chapter first discusses vendor research and informational gathering. Visiting Internet search engines or asking department managers are sometimes the best forms of vendor research and information gathering. It allows the end-user to get involved in the process of ERP implementation. The chapter then discusses the kind of information a company should be looking for when choosing a vendor. Vendor financial position, an implementation philosophy, expertise in industry, and referrals are some key questions companies should investigate.

This chapter also discusses IT infrastructure criteria. This is another important part of the vendor selection process. As some companies wish to keep their existing platforms, a vendor should be able to install a "sandbox" application to demonstrate how the company's infrastructure will interact with vendor applications.

This chapter then discusses the procedure of identifying and documenting user information and system requirements for ERP implementation. The chapter discusses the two major documents

resulting from selecting functional requirements. The first document, a functional and data flow chart provides a microscope look at the business process and how a company can make changes in the process. The second document, the table or description of functions, describes how important each function is to the company. This information will help a company make an educated decision about a vendor.

After a company decides on functional requirements, it must then request information from the vendors. The company makes an RFI (request of information) document and sends it to a long list of ERP vendors. This will allow the company to review their own functional requirements along with the ERP vendors' features and capabilities. This will make it easier for a company to ultimately determine which vendor to select.

After receiving information from the vendors, a company then sends an RFB or RFP (request for bid, request for proposal) to a short list of selected vendors. The document includes the company's specific hardware and software infrastructure requirements, training requirements, and the type of ERP system that will need to be implemented. From this the vendor receives a clear understanding of the needs and desires of the company. The bid itself includes a breakdown pricing sheet, description of the selection process, and the timeline of how selection will take place. The point of this is to help the company narrow down the selection of vendors.

After a formal bid is processed the company goes through a stage of analysis and elimination. This process is divided into three sections, where departments evaluate corresponding functions. Office staff or end-users evaluate the functionality of the ERP system; IT looks at the technology requirements; and the contract staff evaluates the contract itself and pricing. This evaluation process allows the company to eliminate vendors that cannot fulfill their needs for ERP implementation. Additionally, a company can make an educated decision regarding the cost of the entire ERP implementation. This is called Total Cost to Ownership (TCO). This cost analysis takes into account all inductive costs of a full life cycle of ERP implementation. The majority of TCO costs occur after the ERP implementation. TCO is very difficult to estimate and deals with the training and upgrade aspect of ERP implementation. This process is beneficial to the company because it gives an understanding of how the ERP implementation works with the company's financial situation.

Chapter six also discusses contract arrangement and license agreement. The primary purpose of this phase is for both parties to end up with a written monetary agreement and a written plan for a successful ERP implementation. There should be an appointed contract manager involved in contract implementation. This liaison monitors both sides to make sure the vendor and the company uphold their end of the bargain.

From this chapter students learn that selecting an ERP vendor is a matter of problem solving. To solve a problem one must investigate, brainstorm, evaluate and determine a solution. Selecting an ERP vendor is the same process, although it can be a difficult choice. There are so many factors, such as employee satisfaction, business infrastructure, and financial resources, which affect how a company chooses a vendor.

ADDITIONAL RELATED INFORMATION

1. ERP consulting companies

- a. http://www.panorama-consulting.com/erpsoftwareselection.html
- b. http://zenobia-associates.com/vendor_selection_process.html
- 2. A functional requirement proposal written by the state of Connecticut
 - a. http://www.osc.state.ct.us/vendor/rfps/2000/osc0012000/scope.htm

ANSWERS TO END-OF-CHAPTER REVIEW QUESTIONS

1. What are the steps in purchasing an ERP?

The steps are as follows:

- Vendor research and informational gathering
- Decide on functional requirements and IT criteria
- Request information from vendor on features
- Review information with company's functional requirements
- Request bid from vendor
- Review and Eliminate vendors not suitable
- Negotiate with selected vendor on price and functional requirements
- Come to an agreement and prepare licensing agreement

2. Who generally needs to be involved in the ERP selection process and why?

Everyone in the organization needs to be part of ERP implementation. ERP implementation affects everyone and by keeping an open line of communication it will help everything run as smooth as it possibly can.

3. What is total cost of ownership (TCO) and why should it be a part of the ERP selection process?

TCO is the total cost associated with ERP implementation, including training, software implementation, and upgrades to the system. It is an important part of the selection process because it gives a company an overall look at how much an ERP system will actually cost.

4. What are the key components in contract negotiation and licensing?

The key components in contract negotiation are to evaluate the company's functional requirement and financial resources with the vendor's features and price. Then formulate a plan to make a successful ERP implementation.

5. Why is it important in the request for bid process to make the vendors reply in a specified format?

6. Why is communication important in this phase?

Communication is important because vendor selection involves negotiation and informational gathering. Without clear and periodic communication there is no way ERP system implementation will work. Without clear communication the vendor can misinterpret requirements and not provide the client with the business process software to meet their needs.

7. What is the difference between an RFI and RFB?

RFI is a formal request of information made by a company to a vendor. The information should include both the vendor's features and the compatibility of these features with user requirements. RFB is a formal request of bid which explains who, what, where, when, and how a vendor will be selected and the ERP system will be implemented.

8. What are the benefits of a bidding process to purchase of an ERP?

The bidding process allows vendors to compete for the best price, producing a more affordable ERP system implementation and more flexible vendor to the functional requirements of the company.

DISCUSSION QUESTIONS

DISCUSSION QUESTIONS

1. As Welch Foods narrowed down the vendors in their quest to purchase an ERP, discuss the steps Welch Foods took to get the best price.

- 1. Vendor research and information gathering.
- 2. Needs/requirement assessment after determining what their current infrastructure was using
- 3. Internal selection team creation and involvement.
- 4. Vendor elimination process, to top two choices.
- 5. Vendor selection, determined by which would be easier to implement after fully understanding current and future infrastructure
- 6. Customer referrals
- 7. Price negotiation

By narrowing the ERP decision down to two providers, Welch Foods was able to create a competitive situation, using each provider as leverage against the other. Not only did SAP and Oracle both want the business, but they also wanted to make sure that their competitor

did not have the upper hand during the negotiation period. Once SAP and Oracle became aggressive with their pricing, Welch took other outlying factors into account, such as functionality and ease of flexibility and implementation. The strategy SAP and Oracle both used for pricing also factored into the decision making process. Oracle was very aggressive early on in the negotiations and SAP only seemed to become aggressive as a "last ditch effort". By the time SAP offered an aggressive bid, Oracle had won the order.

2. Describe the components of TCO and why it is difficult to use in comparing ERP systems.

TCO can be difficult to use when comparing ERP systems, because it is difficult to estimate. This makes it hard to anticipate the benefits of the investment. One way to look at TCO, which could make it easier to compare ERP systems, is by deciphering between Direct and Indirect Cost:

Direct Costs: the obvious hardware, software, and mainframe; in addition, annual licensing and ongoing support.

Indirect Costs: less articulated; included the costs of staff tasked with supporting and developing the ERP and the costs for ongoing training.

As would be expected, indirect costs are a mere fraction of the cost to acquire and implement the system, yet they are curial when it comes to the appeal of choosing an ERP system

Components of TCO include

- costs of purchase
- networking costs
- costs of ensuring security
- costs of training
- repairs and upgrades
- maintenance and service support

There are also many intangible costs such as opportunity cost of removing employees from there daily jobs as part of project team and training, and potential costs of lost sales and waste if implementation is not successful.

TCO is difficult to determine, but once an estimate is reached, it should be compared to the TBO (total benefits of ownership) which can include just as many intangible benefits as the costs.

3. Defined and documented functional requirements is a part of the bid process. Discuss why this would be beneficial in the selection of an ERP system even if a bid is not required. When a company is evaluating an ERP system, they have to prioritize certain criteria. By reviewing the documented functional requirements, there is a comfort level that the organization can reach with the software. If it is documented, you can have your contract state that the software must function according to it; you then have some leverage if you find out later that the software does not do behave as it is documented that it should.

Defined and documented functional requirements are the result of the staff/team documenting current legacy system functionality or using business process reengineering to address 'best practices' in the industry. Going through this process will provide the company with well-defined functional requirements; information on which to select an ERP system. Also, a key component of the document is how the integrated ERP system cross-functional data flow affect departments within the company.

CASE QUESTIONS: FRUIT AND VEGETABLE MANUFACTURER

- 1. What are some of the tracking issues a fruit and vegetable manufacturer must utilize in an ERP to better ensure success?
 - Characteristics of the lot such as brix and acidity
 - Specifications of customers (i.e. for juices percentage of solids)
 - Accounting and settlement process
 - Quality control for sterilization of equipment
 - Order of processing (i.e. apples before blueberries)
 - Kosher or Halal certifications
 - Expiry and sell by dates
 - Shipping timing and costs

2. What is an "organic system plan" and what are some of the key features an ERP must include?

Shoppers often want to purchase products that are organically grown and products that only use an organic process to produce the product. This requires elaborate tracking of how the product was grown the ingredients in growing the product and the practices of how it was picked, stored and manufactured in order to assure it complies with organic guidelines.

3. Why are some manufacturing systems specific to a product?

- Lot tracking for ingredients to manufacture a consistent product.
- Expiration of tracking to ensure freshness.
- Equipment usage tracking to ensure the equipment was properly sterilized and used.

CHAPTER 7: OPERATIONS AND POSTIMPLEMENTATION

CHAPTER OBJECTIVES:

- Describe all the components to a successful "Go-Live" and determining their readiness.
- Understand what is involved in stabilizing the system after "Go-Live" and how to track and address problems and issues on a daily basis.
- Value the transition from developing a system to supporting it in a production environment.
- Understand the process of transferring knowledge to operational staff and the importance to the long term system success.
- Realize the value of training before and after "Go-Live".

CHAPTER OUTLINE:

- I. Opening Case: Hugger-Mugger ERP Implementation
- **II.** Chapter Preview
- **III.** Go-Live Readiness
- **IV.** ERP Training
- V. Stabilization
 - a. User Issues and Activities During Stabilization
- VI. Post Production Supportb. The 5 Points of Post-Implementation Support
- **VII.** Knowledge Transfer
- **VIII.** Implication for Management
 - IX. Real World Case: Hewlett-Packard SAP Implementation
 - X. Appendix A: Readiness Status Table Sample

CHAPTER OVERVIEW:

An ERP system is "the first generation of enterprise systems whose goal was to integrate data across and be comprehensive in supporting all the major functions of the organization." These complex information systems cross many different enterprise functions, including accounting, finance, marketing, production, etc. with the goal of making the flow of information dynamic and immediate, while integrating the varieties of departments and enterprise functions into a single infrastructure. Because of the problems associated with preparing to "go live" stabilization, and ongoing support, and the need to successfully achieve the organization's main goals (i.e. labor savings, better customer service and process improvements), operational and post-implementation becomes one of the most critical points in the success of an ERP system.

The ERP implementation phase occurs just before going live and "is the culmination of a number of planned tasks, activities and resources brought together to implement the system based on the goals of the organization." A project's "Go-Live" readiness must be assessed in order to decide on going live to ensure that all tasks and activities are completed before the Go-

Live date. There should be several readiness reviews, starting several months before going live, in order to assess the progress toward it and identify the major issues on which to focus. These reviews need to be well documented and must be communicated to the project team and the company, as it allows individual team members to express concerns about the successful completion of the project and the Go-Live date. The first readiness review should provide management and the project team a detailed list of issues on which to focus. The following readiness reviews should review the Go-Live date to finalize the decision. The last readiness review should assess any of the outstanding issues previously reviewed, and assess the "Go Live" Readiness Review and Status Report.

Training is a key component in the implementation phase and should be provided to all that will be using the system. Although training does not need to be completed prior to going live, it is recommended that organizations use a validation method or certification to ensure that users know and understand how to use the system before going live. It is also recommended that training continue for a short period after going live to assist the users' incorporation of the ERP into their jobs. Training must focus on how the organization is going to use the system and provide realistic examples (with real data) to serve as a practice environment and limit issues with the real system.

The next phase in implementing an ERP system is the Stabilization phase, which begins when the ERP software is in production, initial training is complete, and conversion of critical data is done. This process can last anywhere from sixty to ninety days after going live. During the transitions from Build to "Go-Live" and Stabilization, one should pay special attention to knowledge transfer, as team composition is likely to change, especially third party consultants. The first task in the knowledge management plan should be monitoring the transition from one phase to another and ensuring that knowledge transfer goes smooth. During the stabilization process, teams and users often meet once in the morning and in late afternoon in order to discuss problems and answer questions that may arise. The questions to be answered during this phase may range from how the system is working, incorrect data conversion and system stability. Also required during this process is the monitoring of the infrastructure for response times and to ensure backups are taken appropriately for all hardware and software. The stabilization period can be demanding and frustrating, with many long hours and much anxiety; but when accomplished successfully, it can significantly aid the organization in accomplishing its main goals.

Post-production support is the final phase of an ERP implementation and as important as any set of activities during the development phase. This phase is intended to manage the daily system operations and ensure the system is doing exactly what it needs to. Post-production support generally includes: training, "go live" support, data validation, data correction, and new features. This phase is so important to an ERP's implementation that often times the entire implementation may be considered a failure, if the post production support plan and process are inadequate.

This chapter informs us that "the closer an ERP implementation gets to the Go-Live" date the more project management must focus on the issues, tasks and activities of being ready."¹

¹ Enterprise Systems Management

This readiness process helps to outline which issues the project managers should focus on in order to successfully achieve the organization's main goals. The readiness reviews must fully assess the level of readiness of each project area in order to prepare for going live. The other main point to be outlined is that "to ensure a successful and sustainable ERP implementation, one must have a well thought out and understood knowledge transfer process."² With out properly preparing to "Go-Live" and making the necessary plans for Stabilization and Ongoing support, the PMO risks the long-term sustainability of the REP system and the ability to successfully achieve the organization's main goals.

ADDITIONAL RELATED INFORMATION

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- 3. http://blogs.ittoolbox.com/erp/roi/archives/the-importance-of-erp-postimplementationaudits-14971

(Eric Kimberling, "In Search of Business Value & ROI: Achieving ERP Benefits Realization," *The Importance of ERP Post-Implementation Audits*, March 8, 2007, Accessed: April 1, 2008)

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- http://www.reliableplant.com/article.asp?articleid=10733 (Bernie Goldband, "Reliable Plant," *The Real Reasons Why ERP Systems Fail*, February 2008, Accessed: April 1, 2008)
- http://americancityandcounty.com/mag/government_government_technologytraining_em ployees/ (Tom Ferrando, "Government Technology," *Training employees to use ERP systems*,
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- http://www.kmworld.com/Articles/Editorial/Feature/Knowledge-transfer-is-critical-to-ERP-success-9092.aspx (Rajiv Enand, "KMWorld," *Knowledge Transfer is Critical to ERP Success*, Apr 1, 1999, Accessed: April 1, 2008)

ANSWERS TO END-OF-CHAPTER REVIEW QUESTIONS

1. Why is the readiness process so important to an ERP implementation?

² Enterprise Systems Management

The readiness process is important to an ERP implementation because it assesses all tasks and activities and shows what areas need to be addressed prior to the Go-Live date and should ensure that the Go-Live will proceed smoothly with no threat of backwards retreat to the old legacy system. The readiness process is also important because it assesses the Go-Live date and makes sure that the system and users are prepared.

2. What project areas need to be assessed in a readiness process?

All project areas across the entire span of the project need to be assessed in a readiness process. Some of the areas included are the infrastructure, development, configuration, conversion, testing, training, communications, operation, command central, reporting, and users.

3. What is included (and not included) during the stabilization timeframe?

After the ERP system goes live, the organization will need to shift into a stabilization process that can take about sixty to ninety days. While development should be avoided during this timeframe, management and staff should focus on answering questions about how the system is working, incorrect data conversion, system stability, and perceived problems with the software.

4. Why is knowledge transfer important to the long-term stability of the ERP system?

Knowledge transfer is important to long term stability because it helps to reduce many problems associated with moving from implementation to production. As the teams are likely to change in different phases, especially in the Go-Live and Stabilization phases, a smooth transfer of knowledge is critical to ensuring the smooth transition from implementing to stabilizing the software. The first task should include a thorough knowledge management plan to monitor the transition between phases.

5. What are the 5 areas addressed in post-production support?

The 5 areas addressed in post production support include: Training, beginning prior to going live and continuing after; "Go-Live" Support, a system for when users require assistance; Data Validation, a way to test users and ensure they are proficient in using the system; Data Correction, to update bad data; and updating with new features.

DISCUSSION QUESTIONS

1. ERP systems need on going support to ensure the system does what it is supposed to do. Identify and describe the support structures needed for stabilization and post-production support.

Stabilization: The stabilization process begins when the ERP system software is in production, initial training is complete and conversion of critical data is done. This stabilization timeframe must be used to let the users get familiar to the system, new processes and provide for a timeframe to fix problems or bugs in the system. During the stabilization period, the IT staff will be monitoring the infrastructure for response times and ensure backups are taken appropriately for all hardware and software; often at the same time they are researching and fixing problems. There should be very little development addressed during this phase.

Also, stabilization includes cleaning up data and parameters (sometimes referred to as business rules), and the process of cleaning up the data can lead to significant improvements in understanding the organization's products and processes.

Post-production support:

First, subject matter experts (SMEs) will need to provide ongoing support, and need to be prepared to provide service to many people in their departments, as people will no doubt encounter difficulties. Second, the support process is divided into tiers.

Tier 1: Is considered triage and is usually the Help Desk or Call Center. This group will attempt to address very straightforward problems or questions, often related to password problems or resets or general access issues.

Tier 2: The Help Desk will forward the question or problem to tier 2. Tier 2 support is where the subject matter experts are used.

Tier 3: Tier 3 can be a combination of technical staff along with vendor or implementation partner support. These are often complex problems that will require the technical support staff to research and fix.

There are others ways of providing support to users, in addition to in-person support. The user could access web based frequently asked questions (FAQs), job aids that are printable that describe how to access and complete a function within the system, short videos on using the system and complete training documentation that shows and describes step by step how to use the system.

2. The knowledge transfer process is something that is needed throughout a project. Discuss why it is vital to the sustainability of the system.

Knowledge transfer is the deliberate process of converting conceptual knowledge into broadly applied procedural knowledge. It is achieved through well-designed collaboration and interaction between the knowledge source and the target.

ERP integration requires orchestration of a variety of internal and external resources. Knowledge transfer between employees, vendors, subcontractors and consultants is a critical factor in ERP deployment, use, maintenance, and success, and the post-production process

It is elemental to ERP integration and is critical to ERP success. Including knowledge transfer as a specific deliverable in the contract with a systems integrator or other external resources can be challenging, but will improve the probability of success.

CASE QUESTIONS: HP SAP IMPLEMENTATION

1. What were the common threads between the Hugger-Mugger and HP ERP implementations?

HP failed in planning and providing for the IT problems that eventually cost the company over five times the cost of the original project. The IT problems that are inherent in many of these large ERP projects must not be allowed to snow ball and cripple supply chains and other essential business processes. IT projects and their effect on business processes must be thoroughly assessed and given adequate leeway for unplanned and potentially disastrous disruptions. HP suffered the consequences back in the summer of 2004 because minor IT problems were allowed to become major business disruptions due to inadequate contingency planning. Similarly, Hugger-Mugger's implementation lacks a good, if any, methodology and certainly no understanding of "go live" readiness and how to address the issues once the system was in production.

2. What were the key project management strategies that may have been used to minimize "Go-Live" problems with the HP SAP "Go-Live" process?

Firstly, the project team did not test the legacy interfaces with live data or production data. Inadequate testing of the legacy interface came to the fore when the customer orders could not be taken by the system. The company lost \$160 million due to this issue.

Added to the above issue was the fact that the contingency plan did not work properly. Not enough time was spent on the back-out plan.

Another major issue was the planning around training of the new system. Training was administered before the Go-Live Date without any refresher courses just before the implementation date. This resulted in many questions as well as ineffective usage of the system by the users.

3. When implementing an ERP system, especially supply chain systems, identifying risks and minimizing them require planning. Discuss how IT needs to work with the business to address "Go-Live" planning and issue resolution.

Key business processes need to be defined by the functional users such that the IT team can ensure there is a process in place to ensure business can continue if there are issues with performance or the system working properly. This includes good testing and recovery processes, along with a contingency plan that allows for moving forward or even retreating to the legacy applications, if necessary.

CHAPTER 8: PROGRAM & PROJECT MANAGEMENT

CHAPTER OBJECTIVES:

- Understand the difference between program management and project management
- Describe the structure of the PMO (Project Management Office) and the areas it needs to address in an ERP implementation.
- Realize the skills needed to be a project manager.
- Identify critical success factors in an ERP implementation.
- Comprehend the value of a change control process for managing scope creep.

CHAPTER OUTLINE:

- I. Opening Case: ABC Manufacturing: A Hypothetical Case in Unresolved Issues
- II. Chapter Preview
- III. Project Team
- IV. Module Experts and Subject Matter Experts
- V. Project Leadership
- VI. Critical Success Factors
 - a. Decision-Making Process
 - b. Project Scope
 - c. Team Work
 - d. Change Management
 - e. Implementation Team & Executive Team
- VII. Managing Scope Creep
- VIII. Implication for Management
 - IX. Real World Case: HR Implementation at the Institute
 - X. Appendix A: Sample Goals and Measures

CHAPTER OVERVIEW

This chapter discusses the project and program management that is necessary for effective ERP implementation. Project teams are made up of staff and consultants from various functions of the organization. Before proceeding any further, it is best to explain the difference between project management and program management. Program management is the coordinated management of interdependent projects over a limited period of time in order to achieve a set of business goals. Project management is tactically focused versus strategically focused program management. Program management also focuses on achieving business results to create a competitive advantage; while project management tends to focus on planning and executing the work required to deliver the end product. It is important to note the business goals of program management, as they are necessary to gauge the effectiveness of the new system (i.e. increased customer service, increase in market share, etc.). Since the typical ERP implementation involves multiple projects at once, it is wise to have both a project and program manager. The PMO, also known as the project management office is responsible for ensuring that project teams are working well together and addressing the functionality issues in a timely, open, and efficient manner. The PMO must make sure that team activities remain synchronized and that progress is made while focusing on three major aspects; time, resources, and scope. These three make up the project management triangle which must remain in sync at all times. Should any of these three become unbalanced a lack of progress in implementation will occur. Project managers must possess a wide range of skills such as the ability to negotiate, working well in teams, and demonstrating political savvy.

The module experts and subject matter experts are considered the heart of many projects. Module experts are responsible for analyzing requirements and converting them into solutions within the ERP. They provide direction and application knowledge with respect to business process design, configuration, testing, training and implementation. Subject matter experts provide coordination and facilitation of communications between the project team and the organization. SMEs prioritize functional requirements of the project and provide leadership and expert knowledge. The module experts are project driven individuals where as the SMEs are not. The SMEs do not necessarily posses the teamwork or project process methodology and must be trained to work in a project driven environment.

Project leadership comes primarily from the project manager. These individuals are flexible, disciplined, quick learners, who possess a likeable personality, excellent decision-making and effect motivational skills, as well as political clout within the organization. The PMO, which again is responsible for addressing the efficiency and time of functional areas, must also be wary of other issues during implementation: project start-up interaction or goals between technical and functional staff, commitment of senior management for the length of the project, ERP staff and professional consultant turnover, second guessing project decisions, and passive-aggressive staff and users.

In this chapter there is also a discussion of the critical success factors of PMOs, which include: decision-making process, project scope, teamwork, change management, the implementation team and executive team. Not surprisingly, teamwork is ranked as number one in importance because of the team oriented aspects of project and program management. One of the important critical success factors is change management. ABC manufacturing had positive energy from staff and management however, the skill set of these individuals was not up to the level it needed. Project executive Kathleen Taylor suspended the implementation so that they could reevaluate the situation, and make changes.

If problems occur during implementation changes must be made by using change control documentation ("scope creep"), which helps to outline the advantages, disadvantages, and implications (technical & end-user) of options. By not enforcing change control, deadlines and budget overruns can quickly happen.

Finally, the implications for management are based on communication and the skill set of the PMO. Monitoring multiple activities and issues through the length of the implementation, and communicating project status to management are two of the most important issues facing a

PMO. Meetings and discussions that are well organized help to accomplish communication objectives such as staff ideas, concerns, and opinions.

ADDITIONAL RELATED INFORMATION

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- 2. IT integration improves maintenance performance: linking ERP with project management systems has delivered certifiable results. (SECTIONS: Generation) *Warren Utt.*
- 3. Company Example <u>www.sageproerp.com</u>. http://www.sageproerp.com/products/success/Green_Valley_Growers.pdf
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- 5. Project Management War Stories: an audio blog with interviews from project mangers/executives http://www.pmwarstories.com/pmwarstories/
- 6. Delays, added costs threaten university's ERP apps rollout: project management, testing cited as issues. (Electronic Registration Program)(University of Wisconsin) *Marc L. Songini*.

ANSWERS TO END-OF-CHAPTER REVIEW QUESTIONS

1. What is the role of a project manager and program manager?

The role of project and program managers differs because project mangers focus on achieving tactical objectives, where as program managers attempt to achieve strategic business goals. Typically, project managers are responsible for single ERP modules, i.e. the customer relations' information. The project manager must help set up goals between the technical and functional staff of their module. The program manager's role is to coordinate projects over a set period of time in order to achieve business goals. Both project and program managers must address critical success factors of the project

2. What are the skills, knowledge, and abilities required to be a project manager?

A project manager must be a disciplined, flexible individual that has business and ERP experience. Other skills that are helpful include political clout, formal education, a likable personality and, perhaps most importantly, the ability to motivate. The lack of experience of the ABC manufacturing staff was the reason its ERP implementation failed. The project manager did not have the experience with large ERP systems implementations or with project management; it is not surprising that the initial implementation failed.

3. Name five critical success factors and why they are important to the success of a project.

The five critical success factors of the PMO are the decision-making process, project scope, teamwork, change management, and the implementation team and executive team. The most important success factor is teamwork. Through training and team-building exercises, teamwork can help to keep the project moving along, using fewer resources. Change management uses communication and training to address concerns of staff that will ultimately be working with the ERP modules. These critical success factors are absolutely necessary

4. What role can the company executives play in an implementation?

Company executives are essential to implementation because of their individual support and commitment to a project. The change management that most likely will occur is more effective when executives are involved. Staff feels more secure when executives speak during kickoff meetings and explain how the organization will improve because of the implementation. Some speaking points may include cost savings, gained efficiencies, specifics about each department, and growth within the new system.

5. What is "scope creep" and why is it important to manage during an ERP implementation?

Scope creep is the unforeseen or uncontrollable changes that may happen during a project. If a problem arises during the implementation process, changes must be made while keeping all areas of the project in mind. The "white paper" is a document used to describe new functionality development. Options, costs, and timeframe are all involved in the white paper and can help to prevent scope creep. If these areas go unaddressed project deadlines and budgets can be overrun.

DISCUSSION QUESTIONS

1. ERP implementations usually bring together staff from a variety of places, both internal and external to the business. Discuss the value that training and teamwork will bring to the success of the project.

The importance of teamwork cannot be emphasized enough. In most ERP implementations, project teams are assembled by bringing together staff from the existing organization, new hires and possibly external consultants. It is important that the entire team understands the project goals and objectives, and be able to communicate in the spirit of teamwork to successfully meet those goals and objectives.

Communication and training are the keys to a successful change management effort. It is normal for people to resist change and have a fear of the unknown. However, there is a proven way to calm user fear, and that is to implement an aggressive training program.

"Nothing eases a team's apprehension when starting a new project better than knowing they will be trained in what they have to do."

A good/savvy project manager will make sure that the team members' issues and needs are taken into consideration along with those of the organization. This nurtures a feeling of cohesiveness—successful teamwork. Also, allowing the team to share in the ownership of the system provides for a smoother changeover.

2. The project management office is perhaps the single most important group as it relates to the success of an ERP implementation. Describe the role and components of the PMO and why it is critical to the success of the project.

The role of the PMO is to ensure that project teams work together and address issues in a timely and efficient manner. It helps to make sure that activities are proceeding according to plan and measure progress against plan. It keeps the team focused on the end goals as well as the intermediate steps. The PMO also manages time, resources and scope to make sure a quality end product is delivered on time, on budget with the required functionality.

A PMO is critical to the success of the project because they ensure that the project is moving forward while evaluating risks and managing human and financial resources. It also ensures that communication is flowing amongst all team members and progress is communicated up the ranks.

CASE STUDY QUESTIONS: HUMAN RESOURCE IMPLEMENTATION AT THE INSTITUTE

1. What were the key strategies or success factors for HRMS ERP implementation?

The phased implementation approach worked out well for the HRMS implementation because of the structured detail that went into the planning of the implementation. Every portion of the project from the governance to the various strategies was detailed and followed without exception; allowing the phased approach to be implemented without exception.

The key project management strategies that led to a successful HRMS implementation revolved around the governance that was in place such as; the Information Technology Management Committee (ITMC), Change Control Board (CCB), Technical Review Board (TRB), and Capital Planning Board (CPB). These committees and boards set the framework and consistency needed to run a successful ERP implementation contributing to evaluating processes and key strategic issues.

2. Why was the governance so important to the project?

The institute's project had clear governance and was able to meet changes and challenges as they came along.

The institute managed the project as an investment; emphasized delivery of product and monitored performance on a schedule basis with full benchmarks. Often times large ERP implementations do not address the performance of staff and the system when implementing. The institute was able to balance the need for measurement and the value of the ERP system to meet its overall needs.

CHAPTER 9: ORGANIZATIONAL CHANGE AND BUSINESS PROCESS RE-ENGINEERING

CHAPTER OBJECTIVES:

- Comprehend why ERP systems are implemented to include Business Process Reengineering and "best practices".
- Realize that senior management must be committed to the implementation to assist in over-coming resistance to the change in business processes that meet the company's vision and goals.
- Develop an awareness of Organizational Project Management Maturity Model (OPM3) and how it is used to assess an organization's ability to implement an ERP system successfully.
- Introduce business process management (BPM) and discuss its relationship with BPR.

CHAPTER OUTLINE:

- I. Opening Case: FoxMeyer Drugs
- II. Preview
- **III.** Reasons for Change
 - a. What is organizational change
- IV. Organizational commitment
 - a. Change Management
 - b. Organization Project Management Maturity Model (OPM3)
- V. Business Process Change
 - a. Business Process Reengineering
 - b. BPR Methodology
 - c. Current BPR Tools
- VI. Business Process Management
 - a. Difference between BPR and BPM
 - b. Best Practices of BPM
 - c. BPM Software Vendors
 - d. Core Business Processes
 - e. Order-to-Cash BPM Solutions
 - f. Optimizing Business Processes
 - g. Benefits of Implementing BPM
 - h. Other Examples of Success Stories
 - i. Role of ERP
- **VII.** Implication for Management
- VIII. Summary
 - IX. Real World Case: Nike ERP Implementation

PREVIEW

Organizational change deals with the human and organizational issues to make the ERP system implementation successful. The traditional systems implementation approach focus has always been on designing systems according to the requirements of users (human) and business processes. ERP implementation contradicts this approach by embedding the best practices into the logic of the system and the implementation team's focus is on changing the business processes of the organization to match the best practices embedded in the system. This sometimes requires radical or significant changes to organizational processes and the way users will be working with the new system. As we all know, change is an ugly word, often causing resistance and fear from the users. To counter this resistance, a good ERP implementation team develops a Change Management strategy, which runs parallel to the implementation processes, that involves organizational commitment, business process change and project management. This chapter discusses these issues in detail and their implications for management.

Organizational commitment plays an important role in ERP implementation. In order for ERP systems to be successful, higher-level management must be committed from the beginning of the process to the end of the system implementation. There are two main areas associated with organizational commitment: Change Management and Organization Project Maturity Model (OPM3). Both of these strategies can play a very important role in the success or failure of ERP.

Change management focuses on gathering all the benefits of the people involved in the change and it will also reduce the risk of failure during the ERP implementation. Many organizations believe that change only happens once, and therefore, management does not pay attention to the problems being addressed. For organizations to understand change, all members should be informed of what changes are taking place, and the reason for being applied.

On the other hand, OPM3 is based on the experience in implementing the system. OPM3 will help the organization understand the concept of implementation as well as help the organization have a successful system. The three steps involved in OPM3 are knowledge, assessment, and improvement. OPM3 is important since it plays the role of meeting the budget and expectations of the ERP implementation.

Business Process Re-engineering, also known as BPR, is a process that has combined old processes and new processes in order to improve the services. The ERP implementation relies on BPR since the process determines the "best practice". The Business Process Re-engineering method includes five steps, which are 1) preparation, 2) define the "as is" process, 3) map out "to be" processes, 4) test and measure new processes and 5) re-evaluation. The five steps are the main key to improvement. As we begin to understand the ERP implementation process, we can observe that BPR will help any organization determine whether or not an ERP system will be used. However, there are a few problems that have occurred through Business Process Reengineering. Some of the problems deal with top management trying to take short cuts in order to achieve success. Another problem deals with BPR being advanced in competitive performance. These problems arise from the lack of integrated implementation. The BPR process with ERP discussed in this chapter shows the difficulties that are involved when change management is weak. Without change management, the re-engineering process would not take

place. The stronger the change, the more effective the business process re-engineering will become. As we can see, in some way each method is related to another.

The final topic discussed is Business Process Management (BPM). BPM focus is on automating the process change with models, tools and techniques that allows the organization to be on a cycle of continuous improvement. Unlike BPR, which focuses on radical change and reorganization with downsizing, BPM goal is to make management understand the process and information flow to manage them more effectively. Several vendors have emerged in the last decade for BPM software from Adobe to smaller vendors like PegaSystems. BPM software can help in the ERP implementation by streamlining the business process before ERP system is introduced in the organization.

In conclusion, this chapter has covered the different methods and strategies that will help with the ERP implementation. It is easy to say that top management will play an important role throughout the entire implementation phase. It is the manager's requirement to make sure that the projects and systems are moving smoothly. Organizational change and change management lead to the benefits of ERP. The article on www.businessweek.com mentions companies are looking forward to using change management strategies in a way that will help improve the market. We have learned that by using a variety of methods, organizational systems have been improved. Management should determine what area needs to be changed. Most change efforts fail because some part of the implementation went wrong and the main causes of the problems were not discovered. In short, change management requires strong communication, and top management involvement is key for a successful implementation change. Therefore, in order for the implementation to be successful, the change management strategy has to be well planned and functioning correctly. According to Cisco Systems, business process transformation is a key factor for system changes. Without a successful transformation, social networking cannot be done. As a final note, the more skilled the companies are, the greater the chance of implementing a system.

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ANSWERS TO END-OF-CHAPTER REVIEW QUESTIONS

1. What are the steps in business process re-engineering?

Step 1 is preparation, which deals with setting the goals, vision and identifying teams. Step 2 is the defining of the "as is" process, in which we evaluate the cross-functional issues. Step 3 is mapping out the "to be" process, which is related to ERP and is based on "best practices". Step 4 is testing and measuring, which deals with making sure the goals and visions are met and also continue examining the process and make adjustments where needed. The last step is re-evaluation, which involves improving processes, when necessary.

2. Why is BPR important in an ERP implementation?

When BPR and ERP are used together, organizational boundaries are crossed and change management process can be extensive. ERP and BPR rely on one another to get the best outcome. Without BPR, ERP is not a success.

3. What does the organizational project management maturity model do for a company's ERP implementation?

The OPM3 helps companies understand the ability to implement an ERP system. The highly skilled companies have a greater chance of implementing an ERP system. OPM3 creates a framework through the "best practice" in an organization.

4. What are the steps involved in OPM3?

The steps are knowledge, assessment, and improvement. Knowledge deals with understanding the value of the system implementation. Assessment deals with evaluating the current state of the organizational project. Improvement deals with the strengths and weaknesses of the highly used areas.

5. What is the role of project management office in an ERP implementation?

The project management office has to make sure that all the tasks are completed on time. The manager keeps the executive and team members up-to-date on their portion of the project. The manager's main role is to make sure that all aspects of the project are on track.

6. Why is change management critical to the success of a project from the beginning?

Change management is based on communication. The communication plan will determine the ERP benefits after the implementation has happened. If something goes wrong in the middle of the project, the plan will be looked at thoroughly to determine what has been done and what should have been done.

7. What is usually the critical path of ERP implementation?

A company must develop a logical and strategic reason to implement an ERP system. If the reason is not set, then the ERP system will not meet the management's expectations. Not meeting the expectations will result in a failure to implement the system.

8. What is the role of the cross-functional lead in an ERP implementation?

The cross-functional lead provides leadership throughout the ERP implementation level. The leader makes sure that the deliveries are made on time and that the members are following the plan. The functional lead's main focus is on the flow of the project. The project should be on track and followed as requested by the leader.

DISCUSSION QUESTIONS

1. Discuss the need to have a strong rationale for moving from a legacy system to an integrated ERP system.

Like anything it starts with wanting to add more to the bottom line. A BPR study is done. If the result of that study concludes there is a positive cost benefits ratio to implement a system to streamline processes than serious ERP discussions can begin. It is a long-term investment, however, financial data, and how efficient and streamlined the company is will play a big factor. Even if an ERP system would save some money for the company that does not mean it is right for the company. You must weigh the factors. The risk of bankruptcy, like FoxMeyer, is real. So if you are only going to save say 100,000 per year when your annual revenue is 200 million and annual net profit is 100 million, not a good idea for your company, too risky. You have to justify this undoubtedly massive investment of your company resources, plus consider timing.

2. Describe the steps involved in business process re-engineering and how they are closely linked to ERP implementation.

Preparation – this is where project goals are set

- "As Is" an evaluation of the current processes
- "To be" map out new process that would make an improvement
- Test and Measure test the new processes based on meeting goals
- Reevaluation change tested processes to improve processes

The 5 step process is a great way for the organization to evaluate at all levels, set goals, test the processes they believe will work and also have time to make any needed changes. It is important

that during the reevaluation step the project does not get out of scope when making changes. Organizations should review their goals and be sure that the way they are editing the process flows is the most efficient for the company. Preparation and defining goals and/or the steps involved in both of these processes are major factors that contribute to either the success or downfall. The ability to test and/or reevaluate possible changes for BPR and ERP implementation is a common factor that can make or break a company in the end.

3. Discuss how project accountability is created within the project and within the company.

In general, complacency leads to a lack of accountability and is the main cause of project failures. There are actions the project manager can do to help insure accountability. The first is to plan collaboratively. Planning should not be an isolated exercise; it should be done with the project teams and subject matter experts. Develop a responsibility matrix to clearly define roles and insure people understand their commitments up front. Make sure all the key stakeholders agree on the goals and milestones. This helps gain a commitment from internal and external customers. This especially gains commitment from senior management and helps ensure bidirectional communication channels are created and used. While that is true, there will be some people who will participate by giving suggestions or criticizing but never actually doing the work. Also, you need to be aware of people with a political agenda—they will say one thing in public but try to derail the project in the background.

CASE QUESTIONS: NIKE ERP IMPLEMENTATION

1. How could OPM3 have helped Nike to identify the problems with implementing the demand planning system?

Nike chose to implement the vendor's demand forecasting and supply chain management software (\$40 million) along with customer-relationship and enterprise planning software from sap (\$360 million). Analysts pointed to lapses in project management, too much customization and an over reliance on demand forecasting software (ICFAI, 2005). Nike did not assess the firm's readiness to manage and integrate these two projects. Nike should have assessed the company using OPM3 (organizational project management maturity model). OPM3 covers three main areas: knowledge, assessment, and improvement. OPM3 is scalable and generic enough to assess a firm's level of maturity by analyzing the existence of 600 best practices in project, program, and portfolio management; it was developed by PMI and is aligned with the PMI'S program management book of knowledge (PMBOK). The OPM3 assessment helps an organization develop a path for continuous improvement. OPM3 does this by performing an assessment that gives the firm an understanding of the risk it faces with implementing an ERP system with its current experience and skill level. OPM3 consists of 5 levels of maturity.

The vendor recommended Nike take smaller steps in bringing components of the system online. The vendor's software was effective in some industries; however, it was customized for Nike to be used for the shoe and apparel business. The vendor's software was further heavily customized to operate with Nike's legacy systems. This increased the risk of something going wrong. The primary goal was to reduce the 9-month manufacturing cycle to 6 months. The supply-chain software was supposed to reduce the amount of rubber, canvas, and other materials needed to produce shoes. It was supposed to allow Nike to build more of the shoes their customers wanted and less of the ones that did not sell. OPM3 would have provided Nike the necessary insight <u>not</u> to go big bang with their demand forecasting and supply chain management software. The results of using OPM3 would have lead Nike away from immediately using the software in production. Certainly, OPM3 would have told Nike to listen and assess their vendor's offerings better

2. What were the three primary reasons Nike was successful with the ongoing ERP implementation?

The demand planning system and supply chain management software was implemented first. The problems began with the factory orders, and then the glitch moved through the product delivery system. The result, Nike ended up with shortage of high demand models and an overstock of unpopular shoe models. The excess inventory was discounted drastically and distributed through Nike's outlet stores. The impact, in June 2001, Nike announced that it expected its earnings for the quarter to fall by one-third. Nike blamed the vendor's demand-planning software for the disappointing results following the implementation. Nike claimed the software was too slow, did not integrate well, had some bugs, and Nike's planners were inadequately trained on how to use the system before it went live. The vendor claimed that Nike did not follow their implementation guidelines, methodology, and templates. Both companies felt the financial impact of the unsuccessful implementation. When the dust settled Nike's stock dropped nearly 20% and the vendor's stock fell 22% the same day.

3. Why was a phased rollout the correct decision for Nike?

Nike applied the lessons learned and the ERP implementation was successful. Specifically, a phased implementation allowed for project planning, business and operation analysis including gap analysis, BPR and business requirement mapping, project teaming, proper data conversion, and end user training.
CHAPTER 10: GLOBAL, ETHICS AND SECURITY MANAGEMENT

OBJECTIVES:

- Learn about outsourcing, offshore outsourcing and its business and cultural implications as well as the software as a service model (SaaS).
- Know the ethical and legal issues related to ERP systems and implementations and how to protect the company assets.
- Understand the numerous components to system security and why security must be planned, tested and ready by the time the ERP implementation is at Go-live.
- Examine the impact of Sarbanes-Oxley Act on ERP implementations.

CHAPTER OUTLINE:

- I. Opening Case: Outsourcing at FERC
- **II.** Chapter Preview
- **III.** Outsourcing
 - a. What is outsourcing?
 - b. Outsourcing Drawbacks
 - c. Offshore Outsourcing
 - d. Software as a Service (SaaS)
 - e. Outsourcing Best Practices
- IV. Ethics
 - a. Ethical Principles
 - b. Code of Ethics for ERP
- V. Green Computing
- **VI.** Compliance Issues
 - a. Software Licensing
 - b. Implementation Partners/Consultants
 - c. Audit
 - d. SOX Compliance and EU Regulations
- VII. Security
 - a. Disaster Recovery/Business Continuity Planning
- VIII. Implications for Management
 - a. Outsourcing
- IX. Real-World Case: TJX Security Breach

CHAPTER OVERVIEW:

This chapter covers outsourcing, ethics, legal issues, security, and implications for management. Outsourcing occurs when a company sub-contracts its business processes to another company. The controversy for a long time was that there was potential for one country's economy to be weakened and another to be strengthened by outsourcing. Outsourcing can provide great benefits to an organization in terms of cost, flexibility and diversity. These benefits include: Economical predictability in usually lower, regular monthly payments; Market

agility offers faster cycle time and fewer distractions; Ability to obtain skills that a company is lacking in the implementation process; Technical expertise is available for any changes and for cutting-edge IT solutions; Multiple feedback points from outside the company and; The best practices are available for ERP planning, implementation and maintenance. Some of the drawbacks of outsourcing include lack of understanding of business goals, misaligned expectations, hidden costs, loss of vision and, most importantly, security and control. Offshore outsourcing consists of a company selecting an outsourcing partner from another country. The key advantage of offshore outsourcing is having access to some of the world's best growth markets and low-cost resources. This ultimately lowers labor costs, improves quality, reduces costs and speeds up delivery. Some disadvantages are language barriers, culture clash, and the red tape of international rules and regulations.

Software as a service (SaaS) is a rented or leased model of software that provides maintenance, daily technical operation, and support. It has been emerging as a practical model of outsourcing. SaaS benefits are universal access, ubiquitous computing, standardized applications, parameterized applications, global market, reliability of the web, and transparent security and trust. Most importantly an organization does not have to worry about installation, maintenance or upgrades and can focus on its business processes. There are also limitations to SaaS, namely privacy, control, and prices that do not depreciate over time. Outsourcing best practices consist of inviting a representative or an entire team to work onsite, which is essentially a way to manage offshore relationships, as well as creating a formal governance process to manage it.

Ethics has emerged as the science of morality. This is much different from law, since it involves culture, values and belief systems. A strong code of ethics must be in place when implementing ERP systems to assure customers of the business's dedication to information privacy and security. It can affect ethics in four ways: Privacy, Accuracy, Property, and Accessibility (PAPA). Codes of ethics for ERP systems have become key tools for improving operational efficiency and building alliances and partnerships. There are three theories of ethical behavior that can be used in the implementation of an ERP system. They are: stockholder theory, stakeholder theory and social contract theory.

Green computing continues to make good progress in not only saving on electrical power but a better and more efficient use of computing capacity. Virtualization is the current "buzz" word. Allowing for great use of a server environment there by minimizing the amount of unused capacity. The government is taking a stronger position on energy efficiency with its Energy Star Program. The government will offer tax cuts to organizations that can reduce the amount of carbon emissions.

Security is important because an ERP system can be accessed anywhere at anytime. Company employees need to be aware of the importance of maintaining a secure environment. This requires quality communication and fostering awareness. A security plan is needed to address all issues related to access, with an execution tactic employed to ensure proper installation and testing. User ID and passwords, if used correctly, as well as yearly audits of users with access to the system can provide a safeguard against hackers. Physical hardware security must be established to stop thefts of laptop computers and the loss of valuable information. Some companies are now encrypting hard drives to prevent theft. Network security is vital as it ensures that the Internet connection is secure. Intrusion detection systems are now being set up to detect any unwanted manipulations to computer systems. A disaster recovery/business continuity plan is the last security measure, established as protection against loss of information and revenues in the event of an emergency, system crash or update.

Implications for management can arise in any of the aforementioned areas. Management must be conversant in the outsourcing, ethics, legal, auditing, and security policies to ensure the correct and efficient operations of the company.

ADDITIONAL RELATED INFORMATION

- 1. Outsourcing: http://en.wikipedia.org/wiki/Outsourcing
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- 3. Software as a Service: http://www.saas.com/
- 4. Ethics: http://en.wikipedia.org/wiki/Ethics
- 5. SOX: http://www.s-ox.com/
- 6. Security: http://www.net-security.org/article.php?id=691

ANSWERS TO END-OF-CHAPTER REVIEW QUESTIONS

1. What is outsourcing and why would a company chose to outsource?

Outsourcing is the sub-contracting of the business processes or functions of one company to another. Instead of hiring employees to perform a task, a company will enter into an outsourcing arrangement with another firm to provide services for a certain price and period.

2. What are the advantages and disadvantages to outsourcing?

Some of the key benefits of outsourcing include: a predictable monthly payment, running an application at a lower cost, faster time to solution, large selection of skills, multiple feedback points, best practices available, and numerous upgrade opportunities. Some of the key drawbacks include: lack of expertise, misaligned expectations, culture clash, hidden costs, loss of vision, and security and control.

3. What are the key challenges in offshore outsourcing?

The challenges faced in offshore outsourcing are differences in language and culture; ethical standards may be different in other countries, and the overall willingness to change to fit the needs of an onshore business.

4. List five best practices in outsourcing.

- In-sourcing
- Creation of a formal governance to manage offshore relationships
- Expediency
- Collaboration
- Choosing carefully what to outsource

5. What is SaaS and why is it considered as another outsourcing option?

SaaS is a model of software that can be rented or leased from a software vendor who provides maintenance and support for the software. It is software delivery rather than a market segment. The SaaS model brings lower risk in implementation and better knowledge transfer from integrators. It is considered another outsourcing option because instead of a physical plant overseas it is an Internet connection that provides all the options of outsourcing.

6. Discuss the components of PAPA.

PAPA is the four ways in which IT can impact ethics: Privacy, Accuracy, Property and Accessibility. Privacy is about how well personal information is guarded in the system, Accuracy is how correct the data is, Property is the ownership of the information, and Accessibility is who has access to the information.

7. What are the components of a good information technology security plan?

The components of a good information technology security plan are the assurance 1) that customer information is confidential, 2) that customer information is not sold to other vendors, and 3) that customers get the results accurately.

8. With ERP implementations why would an auditor get involved?

An auditor would get involved with ERP implementations to ensure the basic automated and manual controls are taken into account. It is important to show completeness of the process, data conversions and any discrepancies. The main purpose of an audit is to ensure the integrity of the process and avoid any legal issues.

9. Why is the Sarbanes-Oxley Act important to investors?

The Sarbanes-Oxley Act is important to investors because it provides clear responsibility in IT systems and maintains an adequate internal control structure for financial reporting. Investors benefit from having an efficiently run business with zero chance of being prosecuted for illegal actions, as was the case with Enron, WorldCom, Global Crossing and Arthur Anderson.

10. What should a disaster recovery and business continuity plan include and who should be involved?

A disaster recovery and business continuity plan provides the organization and procedures by which a company can continue to provide business functions in the event of the ERP system is unavailable for a period of time. It provides for the recovery of the ERP system and information while also addressing how the business can continue to function while the system is unavailable.

DISCUSSION QUESTIONS

1. Outsourcing is becoming more and more popular in companies today. Discuss why a company would want to outsource and how should they outsource ERP implementation.

Outsourcing is becoming more and more common in organizations due to the benefits of lower software ownership and maintenance costs. Outsourcing ERP implementation simplifies and/or eliminates the traditional difficulties in implementation and avoids the problems of hiring and retaining an IT staff to run the applications. Although companies have the ability to outsource ERP implementation, the implementation can never be 100% outsourced. There is still a need for the active participation of personnel within the organization to ensure that the implementation is inline with organizational goals. The outsourcing company should have fundamental knowledge of the ERP software and the best business practices associated with the ERP software, but it relies on the organization's personnel to provide the necessary feedback and input about the organizations day-to-day operations.

2. Compare and contrast traditional outsourcing with the Software as a Service. Under what conditions should a company choose SaaS over traditional outsourcing?

Outsourcing occurs anytime when a company sub-contracts its business processes or functions to another company, turning over all or part of an organization's information systems operations to outside contractors, known as system integrators or service providers.

Software as a Service (SaaS) is a model of software that can be rented or leased from a software vendor who provides maintenance, daily technical operation, and support for the software. The Software as a Service model is a good fit for companies with many geographically dispersed and/or mobile software users or users who collaborate with each other or outsiders. It works well for companies that have no need for in-house application developers or experts. It also provides benefits to companies burdened with heavy

3. Discuss how PAPA principles of ethics can be applied to ERP implementation.

management and automatically generates reports.

PAPA stands for Privacy, Accuracy, Property Rights, and Accessibility. It is how IT impacts ethics. As we see in the case of TJX, ethics and privacy have a big impact on how a company is perceived. Although there have not been any large financial impacts with TJX, similar financial concerns or concerns such as HIPPA or even Homeland Security have come into play recently with Veterans' Affairs 'losing' a laptop.

It is a fine line to walk but some companies such as Google seem to fully understand both their financial obligations as well as the moral/ethical ones of keeping information private and using it under laws such as SOX, Sec 404.

4. The Sarbanes-Oxley Act (SOX) is important in a financial environment. Discuss how SOX affects the operations of an ERP system.

ERP systems typically fall under the IT portion of SOX and SOX affects the business financial data. This means, IT must also follow certain SOX guidelines to ensure accountability of financial data. The operations of an ERP system affected by SOX include: security, change management and ERP software development. These are only some of the broader areas but in general terms the same policies for financial data also need to be applied to the ERP. So, for example, if change management has certain controls under SOX so does the ERP

One of the major Sarbanes-Oxley issues involves manual controls. Companies have approvals, sign offs and reconciliations, many of which are manual. And that means two things: (1) The cost to perform these manual controls is expensive. (2) The testing process every year for Sarbanes-Oxley is also expensive.

Problem: Many companies, when they implemented ERP systems from Oracle, SAP, PeopleSoft and others years ago, only activated a subset of the total functionality for two reasons: (1) To meet a deadline to get the software up and running, and/or (2) To keep implementation costs down. So they left out some of the bells and whistles—but those bells and whistles included some neat functionality that can really help from a controls perspective.

Solution: Automate the controls; the costs go down for compliance, testing and performing the actual control.

Also, the two key concerns for SOX are privacy and security violations. Audits are done to company's ERP systems to test the privacy and security levels of the system: who has access to what information and what internal controls are involved in the ERP system. The major areas of privacy include: access to the system, user ID and verification, evaluating configurations relating to business processes, change management and

interfaces. ERP systems integrate almost all business functions into one system, and one database. This includes the major concern of financials and the accounting systems. The fact that ERP systems allow employees in one department to have access to data/information in other departments increases the risk of fraud and information misuse. This is another reason why SOX performs rigorous audits on the ERP systems.

5. Discuss the major security concerns in ERP systems.

Ethics: Companies need to set ethical standards so that they can attempt to govern the use of information that is accessible by their employees.

Information Technology: As information technology gets more and more advanced, more care must be taken to ensure that information does not fall into the wrong hands. A small security breach can cause big problems, as illustrated in the TJX case. PAPA (Privacy, Accuracy, Property, and Accessibility) principles must be followed by all that have access to ERP systems information.

User Access: With an ERP system, all of the company's data resides on one system. This means that any person with access to that system can find potentially private information that could cause harm if released to the wrong people. A strict list of qualified persons must be kept for access to the internal data of an ERP system.

User Awareness: With many of today's ERP systems being web browser based, they are open to Internet hackers that use worms, viruses and Trojan horses to gain access to systems and capture information. An ERP system's security is only as good as the weakest link. This could be an employee that mistakenly writes down his password on a piece of paper, or someone outside of the organization that has been given access to the system for eCommerce purposes.

CASE STUDY QUESTIONS: TJX

1. What are the costs involved in the TJX network breach?

This question can be analyzed in multiple ways. It could be looked at as what are the actual costs of the TJX breach, the quantifiable number of reported losses (e.g. how much in legal fees, security consultants etc...), or it could be measured in intangible losses such as reputation, consumer confidence, company turnover etc. Industry experts have estimated costs running at 1 billion dollars when all is said and done.1 In the teams November 3, 2007 interview with a TJX official, the company said "cost is no issue in our approach to making sure this never happens again" and rightfully so when you think about all the factors that can make up that industry estimated 1 billion dollar figure. Even if TJX's statement on consumer confidence and sales ("our sales or consumer confidence has not dropped off, our sales numbers are very strong and we've suffered no drop off despite what people may think"), that

¹ Courts Filing in TJX Breach Doubles Toll: 94 Million Accounts were Affected, Banks say, Kerber, Ross, Boston Globe, October 24, 2007.

doesn't discount the huge expenditures TJX is making to improve their company and its security. While the list could never be exhaustive below are some of the most critical and expensive elements.

- Investigation fees to figure out who, what, and why things happened
- Wall Street losses, falling stock, poor reports by experts
- Legal fees to outside counsel, plus settlement payments for those affected by the breach, including credit card companies and individuals who have experienced identify theft
- Security consultants to analyze the problems and propose fixes
- Overhauling the security systems and implementing consultant advice (very costly)
- Training employees on the new systems
- Hiring new employees to manage the new systems (usually additional IT staff)
- Government investigation fees (typically in a government investigation, if negligence is found the penalty to avoid bringing charges is paying the government back for expending its resources)
- The payouts on all these things also have a lost opportunity cost element, for example if you spent 330 million on legal, security, and settlement fees, that means not only have you lost that money, but the interest you would have gained from having it, and you've lost the opportunity to invest it in your business.

2. As this investigation unfolds, research the additional costs or loss of revenue to TJX and the credit card companies involved.

TJX will suffer total losses of approximately 1 billion dollars.2 TJX said 45.7 million cards were compromised, 95% of which were expired, however, credit card companies are singing a different song. Reports as recent as October 24, 2007 say 94 million accounts were compromised. Visa says 65 million of its card account numbers were compromised. MasterCard says 29 million of its card account numbers were breached.3 How much is this going to cost? The banks cited sealed testimony taken from officials at the two largest credit card networks.4 A Visa official also put fraud losses to banks and other institutions that issued the cards at between \$68 million and \$83 million on Visa accounts alone, for the filing states, the most specific estimate of losses to date.5 The banking plaintiffs haven't set an exact total for the damages they seek in their suit, but they claim among other things that TJX mishandled its security arrangements and they want the company to pay for unspecified losses and costs such as reissuing compromised credit cards.6 Legal fees will also be costly TJX already has reached a tentative settlement with attorneys representing for TJX. consumers who were harmed by the breach the price of the deal will be around \$256 million.7 TJX also is facing several other investigations into the breach, including one by the Federal Trade Commission and a multistate probe led by Massachusetts Attorney General

⁷ Id.

² Courts Filing in TJX Breach Doubles Toll: 94 Million Accounts were Affected, Banks say, Kerber, Ross, Boston Globe, October 24, 2007.

³ Id.

⁴ Id.

⁵ Id.

⁶ Id.

Martha Coakley.8 Last month, Canadian privacy officials concluded an eight-month investigation into the breach by faulting TJX for failing to adequately safeguard customer information.9

3. What should TJX have done to prevent this breach from occurring? Could they have stopped it?

TJX should have focused more on security tools, monitoring and overall processes to help limit the risk of hackers accessing their network. Several intrusion detection systems exist on the market today, such as VCC/Tripware, CDMS and NetRanger by Cisco Systems. When implemented, these tools could have been effective layers of security for both their Internet and intranet networks, which happened to contain all of the sensitive customer purchase data that was stolen. Sensors within these applications would run monitor ring processes in the background and perform real-time analysis of the network traffic by looking for any anomalies and misuse that is undetectable by other security technologies. If the intrusion detection system was running at TJX, the system would have been able to stop this unprecedented attack. The system would have been able to detect any unauthorized activity, which would have automatically triggered a signal to terminate the specific connection, then permanently block the attacking host, and log the incident and send an email or instant message alarm to the System Administrator.10

⁸ Id.

⁹ Id.

¹⁰ Source: http://newsroom.cisco.com/dlls/fspnisapi32b3.html

CHAPTER 11: SUPPLY CHAIN MANAGEMENT

CHAPTER OBJECTIVES

- Learn about the supply chain network and management drivers.
- Understand the complexity and importance of the integration of supply chain.
- Learn about supply chain components, processes, and flows.
- Know the different levels of supply chain integration.
- Examine the impact of the ERP on supply chain management.

CHAPTER OUTLINE

- I. Opening Case: Managing the E-Supply Chain at Cisco Systems
- II. Preview
- III. Supply Chain Management
 - a. SCM Drivers
 - b. SCM Flows
 - c. SCM Process
- **IV.** E-Business and Supply Chain Management (E-SCM)
 - a. E-SCM Components
 - b. E-Procurement
 - c. Collaborative Design and Product Development
 - d. ERP System and Supply Chain
- V. Integration
 - a. Supply Chain Integration
 - b. Integrating ERP and SCM Systems
 - c. Enterprise Application Integration
 - d. Phases of Enterprise Application Integration Process
 - e. Benefits of Enterprise Application Integration
- VI. RFID
 - a. RFID is Catching on
 - b. RFID Technology
 - c. Data Accuracy and Timeliness
- VII. Implications for Management
- VIII. Summary
 - IX. Real World Cases: Zara and the Limited Brands

CHAPTER OVERVIEW

Historically, manufacturers would order supplies from suppliers, store them in their warehouses until they were needed for manufacturing of a product, after which, the products would then be shipped to another manufacturer for any further value adds necessary, or to a store to eventually be purchased by a customer. This process is riddled with inefficiencies, and does not tend to give anyone in the supply chain much power over anything but their own

part. With the rising number of suppliers, manufacturers, supply channels and outlet channels, new processes are needed to efficiently help handle and process the vast amounts of information, products and services being passed between all of the different parties. Software that is designed to do this is called supply chain management software, and is the focus of this chapter.

Supply chain management software, while similar to ERP software in many respects, varies mainly in that it focuses on external integration, between the many different companies and customers in the supply chain, whereas ERP focuses mainly on internal integration, between the many different units within a single company. This adds some definite challenges for implementation, as sharing information and resources between different companies requires large amounts of trust and cooperation, and there is no option of forcing unwilling parties to use a system against their will, as is possible within a single company (although, methods that do not require such force are obviously be preferred).

When looking at the performance of an SCM system, you will notice that there are four main drivers: facilities, inventory, transportation and information. Facilities are places that the product or service is delivered from; inventory refers to the actual product or service that needs to be distributed between external parties within the supply chain; transportation is the means by which those products or services are distributed; and information, which is the most powerful of the four drivers, keeps track of the other three drivers, enabling both action and analysis.

As touched upon earlier, implementation of an SCM system is mainly about two things: integration and cooperation. You are trying to bring together disparate parties, so that they can work together, which requires a great amount of cooperation on many fronts. There are four levels of integration that you must deal with:

- 1. The information-sharing level, which deals with giving each party direct access to relevant information, to help alleviate the manual processes normally associated with such information sharing. A good example might be if a supplier could see the list of orders that a manufacturer had received, so that it could better plan its own production around meeting the manufacturer's needs.
- 2. The design and planning level works directly from information sharing by determining what to do with that information. Extending the example, the two companies might have an agreement where the supplier knows to automatically deliver the necessary supplies to the manufacturer, based on the order information it receives.
- 3. The workflow collaboration level then determines the integration process. The supplier might know to have supplies ready for a 6AM shipment the next day, so that the manufacturer is never waiting on parts.
- 4. The product development level deals with enabling more detailed requests between parties, so that for example, if a company is designing a new product, and needs certain parts from the original changed, they will be able to efficiently tell their suppliers what their needs are, and hopefully reduce their time to market.

In the world of eBusiness, supply chain management is quickly becoming ever-more important to companies that want to stay ahead of their own needs and the needs of their customers. Technology has given rise to much advancement, but those advancements often take substantial work up-front in order to benefit. If they are leveraged properly though, they can do great things for a company.

Finally, RFID (Radio Frequency Identification) is an important technology for SCM. It involves the use of electronic tags (passive or active) instead of the traditional UPC tag. These tags allow remote monitoring and tracking of products making it a powerful tool for SCM. With improved tracking, organization can plan and manage their inventory much more accurately and at anytime from anywhere. Wal-Mart and the US Government are major promoters of this technology and as the cost of tags drops more and more organization will adopt this technology.

Additional Related Information

- ABC: An Introduction to Supply Chain Management
 - o http://www.cio.com/article/40940
- MIT Center for Transportation and Logistics (CTL)
 - o http://ctl.mit.edu/
- Supply Chain Management Review (SCMR)

 http://www.scmr.com/
- "RFID: A Technical Overview and Its Application to the Enterprise "Web. 7/13/2010 http://www.computer.org/portal/web/csdl/doi/10.1109/MITP.2005.69>.
- Suresh, P., and R. Kesavan. "Analysis of Supply Chain Network UsingRFID Technique with Hybrid Algorithm." JOURNAL OF COMPUTING, VOLUME 2, ISSUE 3 2.3 (2010): 24. Web.
- "Wal-Mart CIO Still 'Bullish' on RFID "Web. 7/12/2010 <http://www.rfidjournal.com/blog/entry/7315/>.

ANSWERS TO END-OF-CHAPTER REVIEW QUESTIONS

1. What are the motivations for an organization to have a good supply chain management (SCM) system?

A good SCM system will help eliminate much of a companies over-head in processing transactions between itself and its many partners and customers, as well as reduce processing time, and possibly time to market.

2. Define SCM in your own words.

SCM is software that helps to integrate external companies by automating much of the processing that would normally occur during their interactions together.

3. List the four drivers of SCM and how they impact the system's responsiveness.

The four drivers of SCM are facilities, which affect how quickly a product or service can be sent out for delivery; inventory, which determines what can be delivered (as well as how fast, by it being in or out of stock); transportation, which determines the time in transit for a product or service; and information, which allows analysis of the other three drivers, enabling greater efficiencies to be designed.

4. What are the major types of SCM software?

The major types of SCM software are Planning Applications and Execution Applications.

5. Briefly describe the SCM process.

SCM involves many distinct processes; some of these are as follows. Procurement is the process of obtaining goods or services from another company. Outsourcing and Partnerships deal with having different companies handle work that was previously internal, due to the other company's greater efficiency in that task. Manufacturing flow management determines how much product to produce, based on information from previous forecasts or point of sale data. Order fulfillment involves pretty much all of the work involved with getting finished, or nearly finished, product to the customer. Customer service management process is a source of information for customers. Finally, forecasting tries to predict future demand for a product or service, so that the company is better able to meet the demand.

6. Why is SCM implementation critical for the success of e-business?

E-Business is such a rapidly changing field, that companies need a system that can adapt to meet the changing demands. SCM is an important part of that flexibility, as it allows far more automation to common tasks, removing some of the barriers between them and their partners and customers. Also, customers have grown to have much higher expectations of e-businesses, and the fact that customers can come from anywhere increase a company's need for such a system.

7. What are the major components of e-SCM?

The major components of e-SCM are intranets, extranets, corporate portals, workflow systems, groupware and replenishment systems.

8. What is e-procurement?

E-Procurement is the use of web-based technology to support the key procurement processes, including requisitions, sourcing, contracting, ordering and payment.

9. How should organizations design SCM systems? Stand-alone or collaborative?

SCM systems should be designed collaboratively with the companies it will most likely be used by, because cooperation is one of the most important keys of having a successful SCM system. If a single company tries writing it by itself, other companies may decide that it does not work well with their own systems, and not use it, thereby defeating the whole purpose.

10. What are the elements and benefits of SCM integration?

SCM integration can be broken down into four dimensions, each having its own elements and benefits.

- 1. Information integration deals with information sharing and transparency, as well as direct and real-time accessibility of information. Some of its benefits include reducing the bull-whip effect, early problem detection, faster response and trust building.
- 2. Synchronized planning deals with joint design and collaborative planning, forecasting and replenishment. Some of its benefits include lowering costs, optimize capacity utilization and improved service.
- 3. Workflow coordination deals with coordinated production planning and operations, procurement, order processing, engineering change and design, as well as integrated, automated business processes. Some of its benefits include efficiency and accuracy gains, fast response, improved service, earlier time to market, and an expanded network.
- 4. New business models deal with virtual resources, logistics restructuring, mass customization, new services and click-and-mortar models. Some of its benefits include better asset utilization, higher efficiency, penetrating new markets, and creating new products.

DISCUSSION QUESTIONS

1. Discuss the relationship between a company's supply chain strategy and competitive strategy.

SCM software "acts as a digital nerve center of the entire business". It allows the company to have information flow linking a number of processes into one system. These processes include customer relationships, order fulfillment and supplier relationships.

Having a strong SCM system can save the companies money by allowing them to be more efficient.

Supply Chain Management software allows for the planning of the raw materials that make up the finished product. The SCM software triggers the buy for raw materials when an order is placed. It also allows the sales force to see standard lead times based on material availability to assemble a finished good.

2. Discuss the role and flow of SCM software.

Supply chain management is a cross-functional enterprise system that uses information technology to help support and manage the links between some of a company's key business processes and those of its suppliers, customers, and business partners. The goal of SCM is to create a fast, efficient, and low-cost network of business relationships, or supply chain, to get a company's products from concept to market.

Role: Usually an accessible, web-based software solution that can provide up to date, real time data to link suppliers and distributors to the home base business process that is hosting the SCM database.

Flow: Usually for service and manufacturing organizations (although varies from firm to firm), the SCMPC is a network carrying different flows to satisfy the customer demand. The flow is owned by the single firm yet coordinated with others needing data, such as customers, suppliers, and manufacturing personnel.

3. Which SCM process according to you is most critical? Explain why?

It is hard to determine which is the most critical process in the supply chain—from getting raw materials to fulfillment of the product and customer support. However, if the focus on SCM systems is information then information becomes the most critical aspect, since the key reason to install the SCM is a seamless and timely flow of info across the chain, upstream to downstream.

4. Discuss the role of SCM in e-business and e-commerce.

e-Business—the role of SCM in e-business is to enable companies to link their internal and external data processing systems via the Web platform, to work more closely with

suppliers and partners, and to better satisfy the needs and expectations of their customers. e-Commerce—the role of SCM in electronic commerce consists of supporting the buying and selling of products or services over the Web platform to support the billing and fulfillment processes.

SCM is taking e-business and e-commerce to the next step. Not only can customers buy online with eCommerce but companies can connect B2B with eBusiness allowing suppliers to buy and view products.

SCM makes this all possible. An SCM system that is web-enabled can give a supplier access to view the inventory of a company's products, which can, in turn, allow those companies to provide better customer service to the end customer.

5. Discuss the differences between e-procurement and e-fulfillment.

E-procurement is part of the overall e-fulfillment process. Fulfillment ('e' or not) is the process of meeting customer demands by ordering the right supplies to stock inventory, storing it efficiently and delivering it to the customer when they order it. Procurement is the more detailed steps involved in managing supplier relationships and handling the purchasing and logistics of raw materials and supplies, which, in turn, creates sufficient, inventory for fulfillment.

E-Procurement is a web-based technology for the business-to-business purchase and sale of supplies and services over the Internet. An important part of many B2B initiatives, e-procurement web sites allow qualified and registered users to look for buyers or sellers of goods and services. Depending on the approach, buyers or sellers may specify prices or invite bids. Transactions can be initiated and completed. Ongoing purchases may qualify customers for volume discounts or special offers. E-Procurement can improve payment processes, and reduce cycle time and administrative processing fees.

E-Fulfillment is provided b a strong SCM as necessary for e-business. It optimizes customer response by merging several important functions: order management, storage and delivery of finished goods. Warehouse execution may involve final assembly and packaging of products. Other benefits include more efficient inventory management, order entry, warehousing and transportation management, and an optimized end-to-end order-fulfillment process.

6. Discuss the critical components in design of SCM systems.

A good SCM must be aligned with a company's competitive strategy and work towards a common set of goals. It must balance between the needs of the customers and competition and have agility and flexibility to improve company's efficiency and support growth.

7. How is EAI different from the integration of SCM and ERP systems? Explain.

Enterprise Application Integration (EAI) focus is on application or system integration to allow for the smooth flow of information across disparate systems. SCM and ERP focus is on integrating the business processes. While SCM emphasis is on integrating business process across organizations, ERP 's emphasis is on integrating business process within an organization.

CASE STUDY QUESTIONS: ZARA & LIMITED

1. Discuss the role of SCM in the retail industry. Give examples from the two cases.

Zara's strategy in the clothing retail business is to understand the customers' needs, produce a new style of clothing quickly in small batches and send it to market for sale. Zara's use of SCM includes four critical information areas: constant collection of information related to customer need and trends, standardization of product information to ensure clear communication, product and inventory management and distribution management with limited human intervention.

The limited's logistic services supports global logistics management and leadership to support the supply chains integrated supply chain operations of Victoria's Secret and Bath & Body Works, which increased sales and significantly reduced the time to market.

2. Is Zara's competitive strategy alighted with supply chain strategy? Explain.

The SCM is aligned with the company objectives. In fact the SCM was implemented as a result of the competitive strategy developed at Zara. Zara's business does very well for three main reasons; short lead time, lower quantities, and more styles. In order for Zara to keep this competitive advantage, their ERP system has to be very good at data collection, product & inventory management, and distribution management.

3. Discuss the role of Zara's SCM system. Suggest how it can be improved.

The SCM quickly provides the data needed to develop a new line of clothing or fashion. From there, the SCM uses information standards to ensure the communication across all its offices in Europe are clear and understood to complete the manufacturing process. Lastly, the distribution process is highly mechanized to minimize human interaction in the actual distribution of the product to stores. Zara's SCM should be integrated with their e-business or web platform to provide seamless connection between their stores and online services.

4. Briefly discuss the supply chain problems faced by The Limited.

The Limited's main problem is a diverse "hodgepodge" of information technologies systems due to a variety of acquisitions. CIO, Jon Ricker outsourced TIBCO software to build a global integration platform. This integration established real-time reporting and integrated the outbound supply chain accountability and reporting (McCartney). Without a single platform, even simple data cannot be combined, compared or analyzed easily.

An important benefit or realization seen by this initial project of integration was the need for business process review. Along with the "hodgepodge" of it systems, there was the equivalent in business processes, many were not documented and many were ad hoc. The integration also allowed an easier integration into the next selection of software.

An integrated outbound supply chain platform was a large part but only a fragment of necessary change for continued success at limited. In September 2007, The Limited granted a contract to Cap Gemini USA to implement sap. "This should bring The Limited that much closer to the holy grail of retailing, a 'supply chain that begins and ends with the customer.'" (McCartney).

CHAPTER 12: CUSTOMER RELATIONSHIP MANAGEMENT

CHAPTER OBJECTIVES:

- Understand the customer relationship process.
- Know the evolution, current status, and categories of customer relationship management (CRM) systems.
- Understand the components and architecture of CRM systems.
- Examine the CRM life cycle and its relationship with other enterprise software.
- Examine the impact of CRM on an organization.

CHAPTER OUTLINE:

- I. Opening Case: Walt Disney's CRM Strategy
- II. Preview
- **III.** What is CRM?
 - a. CRM Evolution
 - b. CRM Today
 - c. Types of CRM
 - Operational CRM
 - Analytical CRM
 - Collaborative CRM
- IV. Customer Relationship Processes
 - a. CRM Delivery Processes
 - Campaign Management
 - Sales Management
 - Service Management
 - Complaint Management
 - b. CRM Support Processes
 - Market Research
 - Loyalty Management
 - c. CRM Analysis Processes
 - Lead Management
 - Customer Profiling
 - Feedback Management
- V. CRM Technology
 - a. CRM Components
 - Market Research
 - Sales Force Automation (SFA)
 - Customer Service and Support
 - Data Mining and Analytics
 - b. CRM Packages and Vendors
 - c. CRM Architecture
 - d. On-Demand CRM
- VI. CRM Life Cycle

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- VII. Implications for Management
- VIII. Summary
 - IX. Real World Case: Plexipave: A Failed CRM Implementation

CHAPTER OVERVIEW:

Customer Relationship Management (CRM) integrates corporate strategy, business methods, and technology to accomplish company goals in a customer-centric environment. Goals include maximizing profitability, revenue and customer satisfaction. CRM technology provides the capture, storage and analysis of customer, vendor, partner and internal information in real-time. CRM should always focus on the customer experience. CRM implementation should be customer-driver rather than technology-driven. For example, Disney's Pal Mickey is wirelessly integrated with the park through the use of infrared; its design was based on a strategy to alleviate customer dissatisfaction during peak hours when long lines would form at rides. To increase customer satisfaction when employees are busy during peak hours, Pal Mickey offers tour-guide information, suggestions for rides with shorter lines, trivia and interactive games for young children.

While ERP systems focus on employees and partners of an organization, the CRM systems focuses on the needs and requirements of the customers and clients. CRM started in the 1980s, using IT to capture customer data to determine what was important to the client. This led to automate customer processes including sales force automation, complaint management and marketing automation. The next evolution saw improvements in data gathering and analysis. This increased efficiency and effectiveness by allowing for customizable customer processes. Eventually, CRM became a tool for customer predictability giving "inside advantage" through data mining—by the late 1990s providing a 360-degree view aimed at personalized marketing, building brand loyalty and growth.

Today, companies have to deliver both quality products and unique dynamic experiences to customers depending on the current "context" of the individual. From a functionality perspective there are two types of CRM's and from an implementation perspective there are three types of CRM:

- 1. Operational CRM provides front- and back-end support for sales, marketing, administrative, and customer-service processes. It improves the efficiency of delivery and support.
- 2. Analytical CRM provides collection and analysis of data gathered during operations to help create better relationships/experience with clients. It stores and value-adds customer knowledge for increased understanding of behaviors and needs.
- 3. Collaborative CRM are the systems that deal with interaction between customer and company. Using channels like e-mail, telephone, Internet and fax the customer can interact electronically with the company.

CRM delivery processes deal with direct contact to support the activities of a customer interaction. They facilitate leads by campaign management and assist the customer throughout the services processes. Support processes deal with maintaining the customer satisfaction with direct contact by market research and loyalty management. Analysis processes are back-end systems that collect, consolidate and analyze customer knowledge. By providing this knowledge to campaign and loyalty management it improves their effectiveness.

CRM technology is different from a call center because while a call center focuses on better communication with the customer, CRM implements a company-wide strategy to reduce costs and

enhance service by increasing customer loyalty. Market research, Sales Force Automation, Customer Service Support and Data Mining all increase the effectiveness of CRM.

CRM life cycle needs to focus on up-front planning to reduce costs during technology changes. Functional requirements must be considered before deciding on architecture. Success or failure is linked to correctly identifying functional requirements. There are many vendors depending on varied complexities of the information needed. A Hosted CRM from an Application Service Provider like Salesforce.com can quickly implement basic functions and is less expensive. It is the choice for small to midsize companies who lack enough internal IT professionals to manage more complex options.

CRM is a strategic business solution and not a technical solution. Management cannot use CRM as an afterthought; it must be part of the enterprise management solution from the start. It should be implemented in a step-by-step fashion, starting from the functions deemed most critical. Each CRM solution is unique and must be customized to meet customer requirements. CRM does come with drawbacks such as increased responsibility to keep customer information secure and private. Ethical lines must not be crossed such as selling customer data.

ADDITIONAL RELATED INFORMATION:

- 1. http://en.wikipedia.org/wiki/Customer_relationship_management
- 2. http://mediaproducts.gartner.com/reprints/oracle/149500.html Commonly Deployed CRM ApplicationVendors in 2006 (Gartner, Inc. (22 June 2007))
- 3. http://www.crm2day.com/library/EEEuukAukEdtvgQDjz.php Choosing a CRM Solution (Benjamin Holtz, President & CEO of Green Beacon 2008)
- 4. http://searchsap.techtarget.com/originalContent/0,289142,sid21_gci776528,00.html CRM: Cutting Through the Hype (By Matt Danielsson, Assistant Site Editor 18 Oct 2001)
- 5. Also interesting article with a market- leader board and descriptions of companies: http://www.online-crm.com/leader board.htm (Accessed 03-31-08)

ANSWERS TO END-OF-CHAPTER REVIEW QUESTIONS:

1. Why is it necessary for an organization to have a good customer relationship management (CRM) system?

CRM systems are necessary to efficiently and effectively support/maintain one-on-one relationships with customers to improve their experience and compete in the global market. By successfully implementing a CRM system, a company can reduce costs and improve customer satisfaction. Focusing on customer's requirements helps with the building of brand loyalty and market growth.

2. Define the role of CRM in your own words.

CRM captures, stores and analyzes customer data in real-time so the organization can improve processes that directly impact customer satisfaction and support them. CRM helps efficiently and effectively carry out its business strategy.

Early CRMs focused primarily on sales management but as technology has evolved, CRM has developed analytical processes that assess each customer interaction with the company. Today, CRM is integrated into ERP, which allows for sophisticated data mining that assists with understanding and predicting customer behaviors and needs.

4. How does CRM impact the company's bottom line or performance?

CRM can help improve the bottom line if carefully planned and monitored throughout. CRM should help implement companywide business strategy that will reduce costs and enhance service by increasing customer loyalty and making quick yet informed decisions in real-time.

5. What are the major types of CRM?

At the highest level, CRM systems can be categorized by functionality (which includes customer service and sales force automation), by business strategy (which includes business, technology and customer as shown in Table 12-1 of book), and by the implementation perspective (which includes operational, analytical, and collaborative CRM implementation processes).

6. Briefly describe the customer relationship processes.

CRM delivery focuses on direct interaction with the customer to support activities to solve a specific customer process. CRM support focuses on assisting customer contact processes rather than facilitating them. CRM analyses are back-end systems that collect, consolidate and analyze customer knowledge improving support for customer contact processes like campaign and loyalty management.

7. What are the major components of CRM?

Market research tools provide sophisticated segmenting and targeting of customer data in realtime. Sales force automation provides sales data (forecasting/reporting) that allows reps to focus more on selling rather than administration. Customer service and support consolidates services into help desk support centers that can be accessed by trained help desk ticket runners or by customers via the Internet. Data mining and analytics include OLAP and other software that looks for trends, demographics and other sales patterns.

8. What is hosted CRM?

A hosted CRM is a type of architecture where the CRM vendor hosts the web site and data. Scalability and performance are better in hosted models than in-house. The main concern with hosted CRM is that the vendor might run into down time. An application service provider like Salesforce.com can offer a hosted CRM for quick implementation for basic functions.

9. How should organizations design CRM systems?

Design should be a strategic business solution rather than a technical one. Up-front planning with top management and constant monitoring should be a key focus. A step-by-step implementation

starting with the most critical functions is important. Security and privacy issues should also be evaluated when collecting customer data to avoid any unethical issues.

10. List the major CRM vendors by their target market.

Large Enterprise—Siebel, Vantive, Clarify, and Oracle Midsize Firms—Servicesoft, Onyx, Pivotal, Remedy, and Applix Small Companies—Goldmine, Multiactive, and SalesLogix

DISCUSSION QUESTIONS

1. Discuss the relationship between a company's CRM strategy and business strategy.

CRM is more than technology focusing on tactical benefits; it focuses more on strategic benefits. Therefore, it is critical for CRM strategy to be aligned with business strategy.

CRM strategy is part of the overall business strategy of a company. CRM integrates corporate strategy and business methodology in order to achieve the overall goals of the company. Simply put. it is just another process/function/tool for a company to succeed in today's world. CRM focuses on supporting the customer and client requirements of the business.

2. Discuss the role of CRM software in improving the company's strategic advantage.

The potential business benefits of customer relationship management are many. For example, CRM allows a business to identify and target their best customers—those who are the most profitable to the business so they can be retained as lifelong customers for greater and more profitable services. It makes real-time customization and personalization of products and services based on customer wants, needs, buying habits, and life cycles possible.

CRM can also keep track of when a customer contacts the company, regardless of the contact point. And CRM systems can enable a company to provide a consistent customer experience and superior service and support across all the contact points a customer chooses.

All of these benefits provide strategic business value to a company and major customer value to its customers. Also, the information collected and analyzed in a CRM program can be used to create a unique branded experience for each client. The thinking is, if you can create a unique and meaningful experience for your customer, they will remain loyal to your brand, which will, in turn, increase sales. A study by Gartner Research predicts double digit increases, between 9% and 11% in CRM software sales into the next decade.

3. Which CRM process according to you is most critical? Explain why.

The CRM process can help the process of understanding the customer. When used correctly, it can provide an organization a strategic advantage by isolating the purchasing patterns of a particular customer market, keeping track of your customers in a centralized location, allowing for management to view what type of customers are purchasing and what type of products are

being purchased. CRM can also keep track of the different variables that must be taken into consideration in order to successfully develop and market new products—the more defined the customer requirements, the better a product or service is when released to the market, the better targeted the marketing campaign, and the fewer customer complaints.

4. Discuss the role of CRM in e-business and e-commerce.

There are many different roles of CRM in e-business and e-commerce. Here are some example roles:

- CRM allows a business to identify and target their best customers on websites-those who are the most profitable to the business so they can be retained as lifelong customers for greater and more profitable services.
- CRM also makes possible real-time customization and personalization of products and services based on customer wants, needs, buying habits, and life cycles.
- CRM can also keep track of when a customer contacts the company, regardless of the contact point.
- CRM can enable a company to provide a consistent customer experience and superior service and support across all the contact points a customer chooses.
- CRM product role is to provide that one-on-one interaction with the customer such that they get what they need from the company through the variety of mechanisms.

5. Discuss the critical components and architecture of CRM systems.

CRM critical components consist of market research tools, sales force automation, customer service and support tools, and data mining and analytical tools. CRM seldom works well in a company environment without customization. Each company has unique customer relationships that make them successful; the CRM needs to address this uniqueness.

6. Discuss the differences between hosted and installed CRM system.

The main difference between hosted and installed CRM systems is who owns the servers where the data is housed. There are advantages and disadvantages to both but the choice depends on the abilities of in-house IT staff and the level of comfort with having someone else storing your data. If the company is large enough to have its own IT staff who are capable of administering the servers and providing support, then installed is the way to go; consultants can always be used to help when necessary. Smaller companies however may choose to use a hosted system if they prefer to focus on their core business functions rather than worrying about IT issues.

7. How is CRM life cycle different from ERP life cycle? Compare and contrast.

The customer life cycle is the steps a customer goes through when considering, purchasing, using, and maintaining loyalty to a product or service. The customer life cycle has five stages: reach, acquisition, conversion, retention, and loyalty. CRM software allows you to collect data from interactions with customers to predict where the customer is in their life cycle. This allows the firm to maximize its marketing ROI by targeting customers most likely to buy, save customers who have declining interest and not waste money on customers who are unlikely to

continue doing business with the company.

In the ERP life cycle, the firm takes the role of the customer. The firm goes through similar stages in its evaluation of ERP products, implementations of an ERP product, maintaining value of the ERP solution, and then declining value of the system. Then the firm will begin the process over again.

CASE STUDY QUESTIONS: PLEXIPAVE

1. What was wrong with Plexipave's CRM strategy?

CRM is unique to each business. Simply using the Seibel system to front-end the dodge reports without looking at the complete process was not giving Plexipave the results it wanted. A more thorough up-front analysis was needed with requirements from sales and input from staff to ensure the buy-in of the product and implementation.

2. What was wrong with McGraw-Hill/Siebel hosted CRM Application?

No attempt was made to customize/personalize the system to meet the needs of Plexipave. They could have used the CRM software to provide flexible solutions that would enable them to automate and manage their evolving customer relationships. A good CRM should provide an integrated solution to provide analytical capabilities to the firm that allow for reduction in costs, increase productivity, and increased revenue.

3. Do you think Plexipave should have implemented another CRM system? Provide detailed recommendations.

Yes, they should implement another CRM system but this time, address the implementation as a project with specific goals and objectives. Plexipave should develop an approach and buy-in from sales and staff to ensure the processes are adapted and aligned with the company's strategic direction and unique qualities.