INTEGRATING ERP SYSTEMS INTO YOUR ORGANIZATION: AN IN-DEPTH ANALYSIS ON THEIR INHERENT BENEFITS, CHOOSING THE RIGHT ONE AND SUCCESSFUL IMPLEMENTATION

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Under the Supervision of Professor Wendy Brooke

Statement of the Problem

In a technology driven world and economy, IT solutions are expanding and reaching into more facets of business than ever before. Among these IT solutions, ERP system use has increased in capability and use exponentially within recent decades. This may lead many managers to look into the possibility of implementing one of these systems in their organization. If these managers remain uniformed on these systems, or the system implementation is careless, it could lead to losses for the organization. This is because ERP systems, while capable of being very lucrative, come with risk if not implemented correctly. In response to this problem, this seminar paper will first provide detailed background information on ERP systems, as well as various capabilities/functionalities and challenges/difficulties associated with these systems. It will then provide analysis of various research data including how to choose the right system, proper success factors/parameters to have prior to implementation, implementation strategy and evaluation/maintenance of the new system.

Summary of Results

Research has found that ERP systems have become a valuable tool at the disposal of modern organizational managers. These systems come with a variety of benefits but also come with great risk when not implemented properly. The risk can be abated with a proper knowledge of ERP systems, how to choose the right system, what factors to have before implementation,

proper implementation strategy as well as proper maintenance and evaluation of the system after implementation. With this information, managers will increase the chances of successful implementation and increase the benefits that come along with ERP systems.

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Chapter 1

INTRODUCTION

Within the last two and a half decades, we have seen an exponential increase in the availability of information technology to business and supply chain managers. These managers are constantly looking for ways to utilize these tools to increase productivity and ultimately lower their bottom line to create more value for not just their stakeholders but also customers. During this technological revolution, a new form of automated business processes management had surfaced, Enterprise Resource Planning (ERP) Systems. These ERP systems manage and integrate all facets of a business including production planning, purchasing, manufacturing, sales, distribution, accounting and customer service, information flows and business process across functional areas within an organization (Ali, M. & Xie Y, 2012, Pg. 114). Having all of these business process integrated into one system not only allows managers to have real time information access to all areas in their charge, but different departments are also able to complete transactions and forward information to other departments instantaneously.

Deciding on whether one should integrate an ERP system, which system to implement, and how to implement the chosen system are all problems that a manager may face. The process of planning and implementing an ERP system would not only be daunting to managers but also confusing and very risky if approached incorrectly. This seminar paper will address the following questions: 1) What are ERP systems? 2) What are their associated benefits and risks of ERP implementation? 3) What type of ERP system is best for one's organization? 4) What ERP system implementation strategies are available for managers?

Purpose of the Study

The primary purpose of this seminar paper is to provide a comprehensive informational guide to managers of organizations/supply chains on how to choose the right ERP system and how to implement that system correctly. In today's business world, ERP systems can be regarded as one of the most innovative developments in information technology and have become one of today's most used IT solutions (Al-Mashari, M. 2003, Pg. 22). Providing a complete comprehensive research approach to the topic of ERP systems will provide managers a more thorough tool for making decisions that could effect the entire organization.

The choice to implement ERP, is not one that should be taken lightly. This study will assist in mitigating the risk by providing an up to date picture of ERP systems in the current business world. For instance, ERP systems are always evolving, just within the last decade alone ERP systems are moving to more of an internet-based architecture and they are focusing on additional business processes to include Front-Office applications (McGaughey, R., Gunasekaren, A, 2007, Pg. 26). Providing current and comprehensive information and techniques on these evolving ERP systems is vital. Even with all their benefits, many ERP systems fail to get off the ground for a variety of reasons and can have devastating consequences. This study will help mitigate these issues by offering business professionals the most up to date information on new ERP systems, which systems will fit their organizations, proper success factors/parameters to have prior to implementation, implementation strategy and evaluation/maintenance of the new system.

Significance of the Study

The significance of this research study lies within two main aspects of the implementation of an ERP system: the risk associated with the implementation and the possible

benefits that are attainable with successful implementation. Addressing the first of these two aspects is risk; as with any business venture. Implementation of ERP systems comes with certain levels of risk mainly associated with costs, time required to implement and whether the implementation is ultimately successful. This process is often very complex and takes many of the organizations resources to get off the ground.

The complexity of the ERP systems is why cost overrun during implementation stands at 178% and the time that implementation takes to complete tends to be 2.5 times longer than anticipated (Ali, M., Xie, Y, 2012, Pg. 114). To compound these risks, attempted ERP implementation projects on average have a rate of failure rate of between 66 and 70 percent achieving goals (114). This risk is quite significant because a failure to implement as planned can have devastating consequences to include large financial loss and perhaps even bankruptcy.

While the amount of risk associated with ERP implementation can be mitigated with proper use of the information provided in this study, the study will also highlight the many benefits that are attainable with a successful implementation and launch. The significance of analyzing the possible benefits of ERP implementation in this study is to try to keep from discouraging managers from pursuing the use of ERP systems. These benefits include "streamlined business processes, improved planning, improved decision making and reduction of inventories" (Vemuri, V. Palvia, S., 2006, Pg. 23). In fact, a recent survey conducted on around 500 executives found that the various performance outcomes were association with the use of ERP systems: quickened response time, increased interaction across the enterprise, improved order management, improved customer interaction, lowered inventory levels, improved cash management and reduced direct operating costs (Pg. 24).

General Plan of Organization

This seminar paper will consist of the following three sections: Literature Review, Analysis of the Research Data and Summary/Conclusions/Recommendations. The Literature Review will provide a comprehensive background of ERP systems. This will include descriptions, its history, capabilities and benefits and difficulties associated with ERP systems. The Analysis of Research Data will then provide information to managers pertaining to choosing an ERP system, factors that improve successful implementation, implementation strategies and performance evaluation and best practices. Lastly, the paper will provide a summary of information provided, illuminate various conclusions and recommendations for managers, and supply chain professionals contemplating ERP implementation.

Chapter 2

LITERATURE REVIEW

The following Literature Review is an overview of various aspects of Enterprise Resource Planning Systems. Current available literature provides insights into what ERP systems are, the history and evolution these systems, various capabilities of the systems, benefits and risks/difficulties that are involved with the systems themselves and their implementation. Understanding ERP system background information will create a needed foundation for any manager considering implementing them into their organization.

Definition and Overview of ERP systems

Like with any new business initiative it is vital to have a complete understanding of the topic before making a decision to press forward with it. This holds particularly true regarding the implementation of ERP systems. ERP is a term tossed around frequently in the business world regarding IT systems used. A very generic definition of ERP systems is simply a computer system that is used to "organize activities, decisions and information flows across many different functions and departments in a firm" (Hwang, 2011, Pg. 9). Ali and Xie support this definition by stating "ERP systems are packaged business software system that enable companies to manage the efficient and effective use of resources (material, human resources, finance etc.) by providing a total integrated solution for the organization's information-processing need" (Pg. 115, 2012). Lastly, Helena Forslund (2009) defines ERP systems as a "business management system made up from a collection of applications or modules that integrates company functions such as marketing, finance, manufacturing and logistics" (Pg. 353).

While the exact wording of these definitions varies slightly throughout available literature,

there is a main central theme to all of them. ERP systems are software that integrates the various functions of the business. They allow the seamless and instantaneous flow of business information between key functions of a business to increase efficiency and speed of processing. This in turn may lead to reduced costs, value creation and the ability for management to make informed decisions based on the information provided by these systems (McGaughey, Gunasekaran, 2007).

History and Evolution of ERP Systems

In the grand scheme of things, ERP systems are a new business commodity. "The origin of ERP can be traced back to materials requirement planning or MRP" (Pg. 24). According to McGaughey and Gunasekaran the initial conceptualization of MRP software started back in the 1960s. While MRP software during this time was good in concept, the actual computing ability limited capabilities. This led to the concept not being actually commercially viable until later in time. When computing power caught up with the idea, the initial systems could only track information and aid in scheduling. They lacked the ability to forecast or transfer data to different departments therefore limiting integration capability. Over time, MRP systems added various functions as the computing ability improved. These include Capacity Requirements Planning, Manpower Planning/HR, Distribution Management, Financial Planning and Manufacturing Planning (2007). This eventually led to what is referred to as MRPII as it now had more and more planning and control functions.

The point when ERP systems as we know today started to emerge was when these closed loop, internal process tool started to gain the ability to communicate with outside agencies. These modern ERP systems emerged in the early 1990s where the various modules became

increasingly integrated to include functions such as accounting, finance, sales and distribution, human resources management, materials management and other business functions (Maheshwari et al, 2015).

Even though ERP systems have changed greatly since their inception, these systems continue to evolve. "As ERP systems continue to evolve, vendors like Peoplesoft and Oracle are moving to an Internet-based architecture, in large part because of the ever-increasing importance of E-commerce and the globalization of business" (McGaughey, Gunasekaran, 2007, Pg. 26). In addition to this, modern ERPs are focusing less on the back office side of a business and are addressing more front office and outside agency functionality. These front office modules cater to interactions that involve users such as clients, customers and other partners. In addition to this, various capabilities were added to accommodate planning/scheduling, sales force automation, supply chain management E-commerce and customer relationship management (2007). Lastly, the ERP systems of today do not just have additional functionality; users of these systems have also evolved. There was once a time when these systems where primarily used by manufacturing firms. Now, they have become popular among various non-manufacturing organizations such as health care, universities and even travel companies such as airlines (2007).

This evolution is not likely to stop any time soon either. The ERP systems of the near future will most likely focus on two aspects, E-Commerce and Mobile Commerce (M-Commerce). McHaugney and Gunasekaran (2007) supports this by stating that "One can expect to see ERP geared more to the support of both e-commerce and m-commerce" and "Internet, mobile and wireless technologies should figure prominently in new and improved system modules and capabilities" (Pg. 28). In addition to E&M-Commerce there is also an aspect that more ERP systems will include in the future, Collaborative commerce or (C-Commerce) (2007).

C-Commerce refers to business conducted between various partners within the supply chain supporting various processes of the organizations. This however is not logistically simple. To do this each partner must buy in to the process and use compatible systems that only share predetermined information. To accomplish this feat, middle-ware and enterprise portal technologies will be used to aid in the integration of the modules and ERP systems (2007).

This constant evolution from back office applications to front office and inter-organizational focus has led to professionals to re-label these ERP systems of the future. Specifically the Gartner group created the term ERPII to describe the future ERP systems (2007). This also refers to more than just the software itself. "ERPII is a business strategy and a set of collaborative operational and financial processes internally and beyond the enterprise (2007, Pg. 31). Just as MRP evolved into MRP II and MRP II evolved into ERP, ERP will evolve into what is referred to as ERPII. The key take away from this history review is that the modules, how they are used, their applicability and their ability to integrate will always continue to evolve. Managers are consistently looking for ways to increase efficiency and accuracy to generate value for their organization. As long as this continues to take place, ERP software will continue to change to better meet these needs.

ERP System Capabilities and Functionalities

To determine if an ERP system is right for one's organization, it is vital to examine what capabilities and functionalities that they possess. Uwizeyemungu and Raymond (2012) states "it is important to know under what conditions ERP systems contribute to organizational performance" and "one could for instance study the eventual links between the characteristics of the installed ERP system and the organizational performance that derives form it" (Pg. 69). ERP

systems of today come with a multitude of modules and functionalities that can be combined in many different manners to accommodate an organizations performance. Due to this diversity, it is important to know what functionalities are available and what business processes that they aid.

When analyzing the capabilities of ERP systems, it is important to review their functionalities. This can be done in one of two ways, by reviewing the available modules or by reviewing the process lines they affect. Constantine (2010) suggests that looking at the process lines aids in viewing how the modules connect inside the system itself. C lists four main process lines that ERP systems address. The first is OTC or Order to Cash. This process line managed by ERP includes everything from selling to billing, processing the invoices and the actions required to receive payment or accounts receivable. The second process line is PTP (purchase to pay). ERP systems can track processes involved in the actual purchase and payment such as purchasing itself, vendor invoices and paying the invoices such as accounts payable. RTR or (Record to Report) includes ERP capabilities that assist in general accounting such as finance and general ledger. The last ERP capability process line is referred to as COGS or Cost of Goods Sold). Included in this line is the production, sales, invoice analysis and profitability analysis (2010),

Rather than focusing on the process lines, ERP system capabilities can also be described in terms of the solutions available in their various modules. The main downside to looking at the capabilities in this manner is that it does not illustrate the integration between them. The following is based on a generic collection of modules and not any specific systems:

- Financial Management (FI) includes general ledger, taxes, accounts receivable, payable, asset management and special ledger (2010).

- Controlling (CO) tracks internal costs, cost/elements/cost/profit centers, internal orders; product/activity based costing (2010).
- Project System (PS) supports projects to included orders, order tracking, billing and even plant shutdowns (2010).
- Human Resources (HR) includes payroll administration, training/career management, employee history and succession planning (2010).
- Plant Management (PM) tracks maintenance on equipment, material required, labor and outages/down time (2010).
- Material Management (MM) supports purchase ordering, requisitioning, receipts, accounts payable, inventory, Bill of Materials and finished/raw material (2010).
- Quality Management (QM) enables processes involved in the improvement of quality of goods produces including aspects of planning, inspection tracking and certificates (2010).
- Production Planning (PP) manages the production process to include planning for capacity production schedules, floor layout and managing material requirements (2010).
- Sales and Distribution (SD) supports all activities associated with delivering goods after sale including quotation requests, Orders, pricking packaging and shipment (2010).

With ERP systems, the amount of capabilities derived from their functionalities and modules are staggering. It is important to realize that not all of these features are needed for most organizations. Managers must analyze their own business processes to determine which

modules will fit within their organization. In Romania, in a 2006 survey, companies valued at one million dollars or more reported statistics of their ERP use (2010). The study found that "in Romania in 2006, 42.9% of the companies had an ERP solution implemented, from these 64.8% were in production area, 57.6% in distribution area and 53.3% in retail" (2010, Pg. 199). In all actuality, only about 20% of the companies had all of the mentioned modules integrated (2010).

Effects and Benefits of ERP Systems

As each individual ERP system contains various capabilities and functionalities, there are also many different benefits associated with ERP system use. The amount of attainable benefits is an important part of the equation due to the costs and other risks associated with them. It is generally accepted that the use of ERP systems include benefits such as "streamlined business processes, improved planning, improved decision making and reduction of inventories" (Vemuri, Palvia, 2006, Pg. 23). This statement is supported by citing a survey of 500 business executives detailing their performance outcomes after ERP system implementation. This survey found that the use of ERP specifically improved nine different areas: response time, enterprise interaction, customer interaction, order management, on-time delivery, supplier interaction, inventory levels, cash management and direct operating costs (2006).

Haug et al (2010) also provide some general benefits to implementing ERP systems specifically through the supply chain. These systems are understood to be an efficient tool used for automation of not just enterprise processes but the supply chain as a whole. This includes everything from the harvesting and production of raw goods all the way to maintaining relationships with suppliers. Included in this is the improvement to planning, production constraint monitoring, increasing forecast accuracy and reduced shipment lead-time. Looking at

supply chain partners' use of ERP systems adds another dimension to the possible benefits. Not only can supply chain partners share information, they also have the option to share the same ERP systems. For these parent-subsidiary relationships, the actual sharing of ERP systems with suppliers or buyers enables that "information about stock levels, purchases, production planning and delivery plans of the supplier can be captured immediately" (Pg. 299). This immediate transfer of information comes with its own inherent benefits regarding the production of good, scheduling, lead-times and any other time sensitive task that affects both organizations.

While examining these possible benefits from ERP systems it is important to keep one thing in mind. Vemuri and Palvia (2006) caution that the benefits of ERP systems are exaggerated and these exaggerations are sometimes taken as fact. Like with any product, lots of time and money is spent by their creators to sell the product to consumers. An example of these exaggerated claims detailed by Vemeri and Palvia (2006) deals with the DIO of Millennium Chemicals. This company released a report that detailed how their implementation of SAP (commercial ERP) helped the organization drop their finished goods inventory by 40%, which saved 15 Million Dollars per year between 1995 and 2000. While they didn't lie, or report false information, what they failed to mention is that their sales dropped from 3.849 Billion Dollars in 1995 to 1.793 Billion Dollars in 2000 (2006). In addition to this, their total assets also decreased by more than half (2006). Taking all of this in to account the perception of ERP benefits becomes murkier. The point of this example is to encourage managers to scrutinize these claims and separate marketing ploys from factual research.

Challenges/Difficulties Associated with ERP System Implementation

Even though ERP systems do come with many potential benefits, there are still some

challenges associated with their implementation. Unfortunately in spite with these benefits (or perceived benefits), ERP systems often fail due to these challenges (Aladwani, 2001). When deciding to implement ERP, managers must understand that this is not a mere simple feat it is a complex endeavor. To illustrate the risks associated, Ali and Xie (2012) provide the following sobering facts detailing ERP implementation success rates. The first is that due to the complexity of the projects, the average cost overrun associated with implementation is on average 178 percent and the implantation time period ends up being 2.5 times longer than originally planned (2012). In addition to this, there has been an observed rate of 66-70 percent of ERP implementation projects that fail to meet their predetermined goals. (2012).

Ali and Xie (2012) also cite an ERP case study on Whirlpool, Hershey, Waste Management, Inc. and W.L. Gores and Associates. In this case study it was found that "SME face considerable challenges in implementing ERP systems due to lack of modern information technology (IT) setup, experienced IT staff, perceived usefulness towards new technology and most important, limited resources" (Pg. 115). In addition to these challenges, it has been found that the actual outcome of the implementation can result in employee resentment in addition to viewing the implementation as a direct threat to their jobs. This in turn can result in employees expressing resistance to change similar to other new business initiatives (Aladwani, 2001).

These challenges and difficulties lead many professionals to warn managers considering ERP implementation. Haug et al (2010) state that the prospect of gaining ERP system benefits does not mean that it always happens and that ERP projects often end up not producing the benefits hoped for by managers. It is also warned that it is important to make sure your implementation and operational strategy are sound because the failure of ERP projects can result in financial difficulties (2010). A failed project can even result in more serious consequences,

even as extreme as bankruptcy for the organization (Ali, Xie, 2012).

In addition to challenges and difficulties associated with organizational ERP system implementations, intra-organizational implementation throughout the supply chain comes with its own unique issues. Haug et al (2010) state that there are three main reasons implementing ERP systems in intra-organizations tend to be considerably more difficult than organizational implementations. The first is that the ability for direct decision-making is separated into multiple organizations. The second difficulty is that it is natural for each of the entities to act in a manner that maximizes their own interest rather than the interests of their supply chain partners. Lastly, each of the supply chain partners usually has their own systems, infrastructure, internal processes and organizational authorities that may not share the same goals causing them to resist the change.

Haug et al (2010) also state that while inaccurate data is a challenge of general ERP systems, it is amplified when using inter-organizational systems. When looking at any business process, accurate data is a cornerstone to success, which is no different in ERP systems. In these cases, any inaccurate data in one section of one organization could cause a ripple effect. As an example, "marginal data inaccuracies (e.g. 1-5 per cent) may not necessarily represent a major problem in manufacturing, but such inaccuracies will have direct effect in terms of lost sales and operational disruptions in the after-sales organization" (Pg. 301)

While these challenges and difficulties may seem as a warning to stay away from ERP systems, it could not be farther from the truth. The purpose of expounding on these risks is to ensure that managers do not jump into ERP implementation haphazardly. It is a complex and complicated process that requires due diligence. Careful planning must take place to not only

implement but to carefully select the right ERP system and choose the best implementation strategy based on the needs of your organization.

Chapter 3

ANALYSIS OF THE RESEARCH DATA

The following analysis of research data was developed to provide managers vital information needed for implementing ERP systems in their organization. To accomplish this it is first important to understand how to select the right ERP system. After the system is selected, the manager must also look for various factors and parameters that they must have before starting implantation. Next, it is important to understand the various implementation strategies at their disposal. Lastly, like many business initiatives, this does not stop with the end of implementation. Constant monitoring and maintenance of the new system must take place and continue to happen into the future. If managers take all of this in to account, their chances of a successful implementation will improve greatly.

Choosing the Correct ERP System

After the decision is made to implement an ERP system, management must decide on which ERP system is appropriate for their organization. Unfortunately, this choice could have a major impact on the success or failure of the system. Bergin (2014) states that it is important to "consider size, product, consumers and the challenges faced in the past" (Pg. 1). To do this it may be necessary to form a panel or committee of individuals ranging from various parts of the organization, management and lower levels with the addition of a possible consultant to help with the decision process.

The size of one's company will most likely have the greatest influence on this decision. A large company will be able to utilize more modules provided by higher tier ERP systems while a small to a mid-range company would benefit from systems designed to service the actual

product that they produce (2014). In addition to the size of the company, Bergin suggests that it is more important to analyze what one's organization values most of all. This could be anything from customer support, price, features, customization or even high-efficiency (2014).

As Bergin (2014) stated, when choosing ERP systems, small companies and large companies will most likely choose different systems. Devesh Dwivedi (2007) specifically addresses how a small business should choose and ERP system. This task is even more important for smaller businesses because they do not have the same amount of resources to bounce back if it fails. For small companies there are several things to keep in mind while selecting a new ERP system.

The first of these is to "Choose an ERP that natively integrates the features one needs" by finding out "which software gives the most features in the particular sector and in no way get influenced by an accounts counselor or the marketing lineup" (Dwivedi, 2007, Pg. 27). Since a small business is on its own, it is vital that they make sure that the software meets all of its most important requirements. The second is to find software that gives one greater control of their business. Picking ERP systems that gives one greater independence from other outside resources can accomplish this (2007). This means that while it can be beneficial for one to use outside professionals or outsource, it is important to not be run over by them. If the owner or manager selects an ERP system it should be one that gives them the ability to manage more facets of their company to keep control of the most vital parts.

For small companies, off the shelf systems are usually suggested. While larger companies can have software customized to their needs, smaller companies will find it better to just use the modules they need in an off the shelf system (2007). In addition, customized software is not as easily or inexpensively upgraded. This would require new contracts and

agreements while off the shelf versions can be updated easily with the most up to date features and technology. Along these lines, a company should find an ERP vendor that knows the industry best and find a product that focusses on their segment rather than just generic software (2007). By simply finding what systems the top performers of the market are successfully using can accomplish this. Not only does this help you find a vetted system, it also means that the software will be able to support one's business if (hopefully when) it grows.

While the type of system is important, functions that it possesses are just as imperative. For smaller companies, there are three main functions that are recommended. The first is the ability to be compatible with major ERPs (2007). "Connectivity and Compatibility to ERP systems of the Principal companies confer cost effective communication and data exchange in uniform format" and "other benefits could be better monitoring and control, smooth order processing and reduction in order to payment cycle" (Pg. 28). The second important function is the inclusion of Management Information Systems (2007). Having reports generated by Management Information Systems will help small businesses gain better vision on performance allowing for better decision making. Lastly, it should include Maintenance, Support and Upgrades (2007). With a small business, the resources are not available to hire a full time employee or team to manage and support the ERP system. This is why a small business must find software that includes post sale support in these regards. Before purchase, verify what support they offer, how fast to expect responses and whether it will be in person or net-based (2007).

The last important aspect of choosing an ERP system for small business is the cost of the system. Unfortunately, good ERP systems are expensive, and even though a small business has less at their disposal, they should not skimp on this expense. With ERP systems, you end up

getting what you pay for, if you do not pay premium for premium systems, you will get less documented and developed solutions (2007).

Managers and executives of large companies will use some of the same criteria as small companies but will also look at additional aspects. Constantin (2010) states: "choosing the right product is related to the dimension of the company, to the budget, to the particularities of the business" and to "analyze the current business, the internal processes, the critical point inside the company and also the strengths" (Pg. 200). Just as small business would, there is even more internal analysis of need that has to be conducted for large companies to choose ERP systems. A trained technical analyst should conduct this analysis for large companies, thus ensuring that the new ERP system is able to integrate and function with the existing network infrastructure. Unfortunately, the existing infrastructure may need modification to meet the needs of an ERP system that is the right fit for the organization.

As mentioned before, quality ERP systems are not inexpensive. This analysis will also need to include cost calculations to include all hidden and after installation costs. When this is calculated, the possible cost savings must be weighed against the cost of the ERP system that is planned for implementation. Then if the infrastructure and the cost of the ERP system candidates are in line with need, then there are several other criteria that must be looked at when comparing ERP systems for a large organization. They are as follows:

- Functionality (2010): Does it cover all business functions?
- Technical Architecture (2010): What are the required technical and integration capabilities?
- Cost (2010): How much is the total cost of ownership?
- Service and Support Level (2010): What level of support is provided by the ERP vendor?

- Ability to Execute (2010)
- Vision (2010): Does the ERP system support the organizational vision?

By using these criteria, a large organization should be able to select the best ERP system to meet their needs.

Success Factors/Parameters Prior to Implementation

Now that the decision is final that an organization wants to implement and ERP selection is accomplished, the organization needs to verify some aspects of their company. These aspects are referred to as success factors, which are conditions that exist in a company that help to maximize the chances of successful implementation. Saini et al (2013) classifies these as Critical Success Factors or CSFs. These critical success factors fall into three main categories: organizational factors, technological factors and people factors (2013).

The first and largest group of Critical Success Factors are classified as organizational. This includes change management culture and program, top management support, BPR with minimum customizations, business plan/vision, project management, communication implementation strategy/timeframe, project cost planning/management, client consultations, ERP selection and consultant selection/relationship.

The first critical factor of this group, Change management culture and program is "the commitment of an organization to change influences the implementation process significantly" (Pg. 107). This commitment includes not just cultural but also structural elements that need managed within the organization (2013). Historically, when ERP implementation fails this is a contributing factor. Even when implementation costs start to overrun, it cannot be stressed enough that training in this manner should be protected from the cuts (2013). This training is not

just for the individuals implementing the system. To ease the change, which will be discussed in greater depth in the implementation section, managers and users alike need to be well trained on the system before full launch. This should include also including focus on the end user so they are able to see how their job will change after the implementation (2013).

The second critical success factor of this group is having support from top management in the organization (2013). As with any undertaking or initiative, having it championed by the top levels of management is paramount. Their attitude towards the implementation including involvement and willingness illustrates its priority (2013). This increased level of involvement also tends to increase the chances of the upper levels of the organization being able to predict possible hiccups and issues in addition to the decision making process.

Minimum customization refers to the ability to align their processes to fit the new ERP system (2013). This may even require the re-engineering of the organizations existing processes. "Organizations should be ready to align their processes to match the software in order to align to industry best practices and minimize amount of customizations needed" (Pg. 108). This reduces the amount of customization needed for the software itself. This is important because customization of the ERP system essentially makes it so updates to the system are virtually impossible without buying a completely new system. This will also include selecting the ERP system based on these processes, which is also a critical success factor.

In addition to analyzing processes, the organization also must look at their business plan and vision. The new ERP system will not just effect one department; it will reach into the majority of departments. In preparation, a well-defined business plan and vision must be in place to be able to implement the system (2013). "The goals should be quantifiable and planning should include certain element of risk and quality management" (Pg. 108). This will also help

with evaluating the success of implementation after the fact. This vision will then aid the next critical function of project management.

The factor of project management is essentially ensuring that there are goals and milestones set before implementation and having the capability to monitor progress to keep the project on track. This will work in conjunction with training and HR to establish committees including organizational managers. These steering committees will take part in not just the selection of the ERP system but also the actual implementation and its progress towards meeting benchmarks and goals (2013). This will then lead into the critical success factor of implementation strategy and timeframe. Implementation strategy and timeframe includes the selection of a predetermined ERP implementation strategy, tracked by stages (2010). With these, it is then important to have the critical success factor of project cost planning and management (2013). As mentioned several times prior, ERP systems are not cheap. Organizations must be able to adequately track and manage ALL costs associated with its implementation.

Most companies will also require the use of outside assistance to meet their implementation goals. Prior to implementing, the critical factors of client consultations and consultant selection and relationship must be assessed. "Researchers have also emphasized on the need for an organization to keep its clients well informed of the projects to avoid misleading assumptions and speculations regarding the project" (Pg. 109). While it is important to consult with clients, it is also important to consider the option to higher professional consulting from an external source (2013). This can even include having one of these consultants being included in an implementation team.

Now that Organizational factors have been covered, technological critical success factors of software development/testing/troubleshooting, appropriate business/IT legacy systems, IT

infrastructure, data conversion and integrity and system testing must be in line (2013). The first, software development, testing and trouble shooting, starts with annotating and recording all of the needs that implementation and the ERP architecture must include (2013). Based on this, the selected ERP system should be tested vigorously to see if they fulfill these needs. If the organization still is using a legacy system, appropriate business and IT legacy system factor should be assessed, looking at what changes are required for install for compatibility (2013).

This also holds true in regards to the IT infrastructure of the organization. The existing infrastructure at the time of implementation has a huge impact on the success of the ERP system (2013). It should be analyzed and updated as needed to support the new system (2013). Lastly, when all of the above steps are complied with, the organization needs to look at their ability for data conversion and integrity. In this last technological factor, the ability to transfer old data into the new system is of upmost importance. During the migration of data, lost data or inaccurate data can cause grave consequences in the future.

The last group of critical success factors, people, includes ERP teamwork/composition, project champion, empowered decision makers, team morale, team motivation; training and job redesign (2013). With any project of this magnitude, the first step is to make sure the team is ready for the task by having the right people with the right knowledge in the right places. With these teams, it is vital to also have a project champion. This upper level manager needs to be the front person for the initiative who also sets the goals and approves changes while handling conflicts as they arise (2013). Under this project champion, there needs to be a group of empowered decision makers. This team must have the authority to make the right decisions at the time they are needed to get the most out of the implementation (2010). These decision makers will also look after the factor of team morale and motivation. During a project of this

magnitude, attention must be given to keep people happy and motivated. "Staff retention is one of the primary concerns, as losing staff in between the running project, had been cited as one of the reasons for project failure (Pg. 110). Lastly, before launch, training and job redesign must take place. This should include hands on training of users of the future ERP system and possibly moving staff to flow better with the new system (2010).

Implementation Strategy

When an organization has selected their future ERP system and evaluated their critical success factors now comes the time for implementation. The first general step, regardless of which implementation style used, is the knowledge and use of change management skills. This will be needed not just for first time ERP implementation but also if the organization is upgrading or switching ERP systems.

Often, during implementation, failures are caused simply by the organization not being ready to manage the changes to processes and people. It has been found that almost 50% of all ERP projects fail to achieve their desired benefits because the organization managers do not realize and the amount of work that is required to manage the change itself (Al-Mudimigh et al, 2001). This is because installing a new ERP system results in a major change for almost everyone involved. So proper change management is imperative when preparing to implement a new ERP system.

One of the largest hurdles that managers will most likely face with an ERP implementation is the employee's resistance to change. To combat this, one of the most effective tools that managers can utilize is involving as many employees as possible with the change (2001). This level of user involvement shows each employee not just how the new system will help the

organization as a whole, but also the end user benefits. The second main cause of resistance is the lack of adequate training of the end users before implementation (2001). As addressed by the critical factors, ERP systems are very complex systems that can intimidate users that are unfamiliar with them. This lack of training is also one of the other more significant causes of ERP implementation failure (2001). While training all of the employees can be a daunting undertaking, it is an important step that should not be slighted. The more prepared the employees are, the less trepidation they will have resulting in less resistance to the change and better performance after launch. Due to the complexity of this training, it is important not to underestimate the costs associated with it due to the time and resources that will be required (2001).

The last tool to manage the change that will be discussed, is possibly the most important, Communication. Unfortunately, "communication is one of the most challenging and difficult tasks in any ERP implementation project and must cover the scope, objectives and tasks of an ERP implementation project" (Pg. 220). One of the most effective ways to increase communication effectiveness is to adopt an open information policy (2001). This can be accomplished by healthy email traffic but the need for face to face/telephone contact is still needed when more substantial issues arise. It is also suggested that the following details should be shared thoroughly throughout the implementation (2001)

Rationale for the ERP system and overview of the implementation

- Sharing the change management processes
- Demonstrating the ERP software modules
- Change management strategies and tactics
- Various contacts

- Real time updates of the implementation progress

After the change management is in a place that it needs to be for greater chances of success, implementation can begin and the implementation plan can be initiated. "An implementation plan refers to a plan of action that entails the transformation of ideas into action" (Schniederjans, Ydav, 2012, Pg. 374). While the implementation plan also includes the cost and benefit analysis, critical and system selection too, the focus will be on the implementation as a whole in a more general sense. Constantin Daniel (2010) provides an excellent general timeline or life cycle approach to ERP implementation based on various phases: of 1)System Preparation, 2) Preparation, 3) Blueprint, 4) Realization, 5)Final Preparation and 6) Go live and Stabilization (2010). These phases have several topics that have been covered in detail previously.

Immediately following the selection of the ERP system that is to be initiated, the project preparation phase will begin. Within this phase, complete the following tasks (2010):

- A macro implementation plan is created during initial project planning
- The procedures such as naming conventions, hierarchy and methodologies will be developed
- Team members will be identified and selected and individuals will be selected to begin training
- The actual project kickoff will occur which can last between a few days or weeks depending on organizational size, this will also include the procedures being released to the teams
- The technical requirements are addressed to help identify any issues that may arise
- Quality control checks will be developed and a plan will be put in place for the duration of the projected

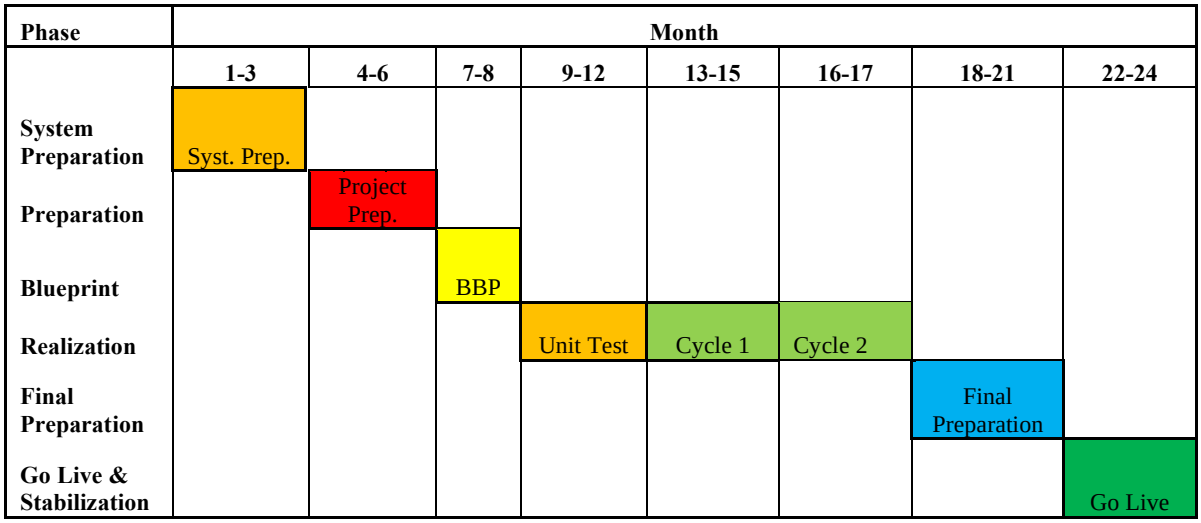
"During the blueprint phase a detailed study of business processes and business requirements are undertaken by the project team members" (Pg. 201). Within this phase, the teams that were established in the previous phase will start working and interacting with other teams and the owners of the various effected processes. During this phase, documentation is key and this information is compiled into a Business Blueprint or BBP (2010). This document will contain the following components: project management, change management processes, required training, developed system environments, the structure of the organization, the analysis of business process and their definitions and quality control checks (2010).

The next phase of this implementation plan, the realization phase, includes the implementation of all of the pre-established process and business environments (2010). Configure the ERP system systematically in two work packages, baseline and final configuration (2010). These work packages includes: "development of external programs and interfaces, unit testing and documentation, final integration test, business scenarios and process documentation, end user training and document and quality check" (Pg. 201). As soon as this is completed, it is time for the final preparation phase to begin. During this phase various activities completed, discussed and documented: system management, volume and stress tests, strategies and plans for cutover, training of end users complete and quality control check (2010). When these activities are completed this then leads into the configuration of the system settings to prepare for going live.

Now the organization should be ready to make the big leap, when they enter the go live and support phase. During this phase, move all of the different customized configurations to the actual production operations and the organization starts to use the new ERP system for all of their activities (2010). One key component to this phase is the identification of any and all

problems that arise pertaining to operating system databases, hardware, networking, training and all applicable systems (2010). This is best accomplished by the end users during the course of their duties and reported through their team leads (2010).

Lastly, even if it appears to be a successful implementation, the job is not over. The organization will just enter the continuous improvement phase. This phase should continue until the organization is finished using the implemented system and they start a new life cycle with new software. During this phase, the system maintain, upgrade and assess against pre-determined goals (2010). Below is a sample ERP implementation broken down by the described phases.



Another variation of implementation phases, similar to this is provided by Peslak et al (2008). These suggested phases include: preparation and training phase, transition phase, performance/usefulness phase and lastly the maintenance phase (Pg. 27). While these to phase guides differ in terminology from Constantine Daniel, they both cover roughly the same order and items to be accomplished.

While these strategies focus on individual organizations, many of the benefits can be amplified if the organization's supply chain partners choose to implement the same or

compatible ERP systems with the hopes of helping the group as a whole. There are several implementation options for these companies, depending upon the specific situation. The following are different variations that can occur; separate ERP systems, open ERP systems of different types, Open ERP systems of the same type and a shared ERP system (Haug et al, 2010). These different strategies come with their own inherent pros and cons and depend on the companies involved. Within the open and shared strategies, information is shared more rapidly and efficient for companies that are able to share more data with one another. In the separate scenario, this would be ideal for companies that may work together or compete against each other and want to keep some information close to their chest. Either strategy that they agree on, can be implemented in the same fashion using the phases listed previously.

Evaluation and Maintenance of the New ERP System

After implementation is complete, many strategies suggest there is a continual maintenance or improvement stage. There are two main aspects of this: the need for continual monitoring of performance and a need for continued maintenance to the system. Goldstein (2006) details this effort by explaining post implementation of a student information system ERP. Unfortunately, the implementation is never truly over until the organization starts a new implementation initiative for a different system. The real down side to this is that "more than half the costs of owning an ERP system stem from indirect costs such as the staff time required to operate and maintain the systems (Pg. 53). This however is predominately centered in the organizations information technology department; hence, this explains why post implementation costs in an IT department increase due to the new system. (2006). The IT department cannot do all of the monitoring and maintenance themselves though. This final and lasting phase requires a

collaborative effort of users to report problems (2006).

This post implementation effort can be aided by several strategies, governance, continual operations improvement, clear responsibilities and forming new working relationships (2006). The first strategy of governance provides guidance to accomplish many tasks related to the new system by maintaining committees. The tasks that these committees will handle includes setting priorities, completing cross-functional issue coordination and making decisions for future projects (2006). This is important because decisions must be made pertaining to day-to-day operations of the ERP system, discretionary tech projects, any alterations to system configurations and the approval of patches to the ERP system (2006).

The second strategy, continual operations, continues the use of the project teams that were used during the implementation (2006). Just because implementation is complete, there are still many of the same tasks that these teams tackled during implementation that still need to be accomplished afterwards. These teams will handle planning upgrades to the system and monitoring business process to ensure they are still in line with the software (2006).

Just as governance manages the decision making process for the system as a whole, there is still a need to set clear lines of responsibility about the system operation. With these systems, the majority of control and operation of the new system lies with the non IT end users (2006). For continual maintenance, responsibilities need to be divided between IT, functional offices and shared user responsibilities (2006). While IT will handle maintaining hardware/systems, developing modifications, installing upgrades and trouble shooting, the functional offices will maintain configurations, run batch process, create reports and train users (2006). This leaves researching new releases, new functionality and performing upgrades as shared responsibilities (2006). Lastly, during this phase, new working relationships not only need to be formed but also

maintained. This is needed due to the shared responsibilities of the previous strategy. "Close coordination and frequent communication must be maintained between user areas and functional units to make sure these ongoing adjustments occur effectively" (Pg. 64).

Too often managers fail to realize what is required after implementation of their new ERP system. Switching to an ERP system is not an easy undertaking and managers need to be willing to go the distance. If proper care is not taken to operate and maintain the system, all of the resources and time to implement may be for not. Managers need to understand that implementation will not ever end if done correctly.

Chapter 4

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

With the widespread use of Enterprise Resource Planning systems on a steady rise during the last several decades, there is an increased need for managers to be knowledgeable of these systems. The evolution of these systems started with simple Material Requirement Planning systems without any connectivity or integration capabilities. Slowly, as technology caught up with organization's desires, more and more functions and capabilities emerged. This eventually led to the emergence of the ERP systems of today. ERP systems now have the ability to integrate almost any facet of an organization. This integration is even capable outside the organization with other supply chain partners.

These capabilities may lead managers to look at the possibility of installing these systems in their organization for their inherent benefits. Before this is done however, managers need to first weigh the advantages versus the risk of installing such a costly system. As long this analysis leans in favor of ERP, the manager needs to be able to analyze their business processes and find the right system that will support them the best.

After the system is selected, change management needs to be accomplished and the organization needs to be examined for critical success factors to help aid in a smoother transition to the new system. When all of these things are in order, it is then time to start the implementation plan and integrate the system into the IT structure of the organization. This implementation does not actually have a specific completion. After installation, care must be taken to properly evaluate, operate and maintain the system for the duration of its life cycle. These systems are not "set and forget" and will require attention to keep it operating a peak

efficiency.

This information is not meant to scare organizational managers away from choosing to implement ERP systems. It is to make them aware that there are proper ways to approach choosing and implementing these systems. Without taking these steps the chances of the risks outweighing the rewards increases. ERP systems are not cheap, nor are they easy to implement and the manager needs to be properly prepared for this undertaking.

Recommendation for Further Research

As mentioned several times, ERP systems of evolved immensely over their history. It would be foolish to assume that they will not change in the future as well. Just as a doctor must stay up to date on new medical practices, managers should stay abreast to further changes in ERP systems and their capabilities. The capabilities and various modules will not be the only aspects of the system that may change. It is recommended that managers continue to stay educated and research the most current ERP systems in the future and the best implementation techniques available.

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