"CHALLENGES IN IMPLEMENTATION OF AN ERP SYSTEM - A CASE STUDY"

A DISSERTATION REPORT SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR AWARD OF THE DEGREE OF MASTER

MBA (Logistics & Supply Chain Management)

Guided By : Prof.Vikas Kumar
Assistant Professor
College of Management & Economics Studies
University of Petroleum & Energy Studies,(Uttarakhand),
Dehradun – 248 006

Submitted by:
Mohan Subramanium
SAP ID.: 500065535

UPES Centre for Continuing Education

University of Petroleum and Energy Studies,
Dehradun, Uttarakhand, India
December, 2019

Acknowledgement

This is to acknowledge with thanks the help, guidance and support that I have received during the Dissertation.

I have no words to express a deep sense of gratitude to the management of UNIVERSITY OF PETROLEUM & ENERGY STUDIES, DEHRADUN for giving me an opportunity to pursue my dissertation, and in particular Prof.Vikas Kumar, for his able guidance and support.

I must also thank the faculity Suman Grover and Shankuta Trivedi for their valuable support.

I also place on record my appreciation of the support provided by Anju sharma the librarian and project manager (Bijesh) for the data collection during the preparation.

Mohan Subramanium

Date: 30-10-2019

Place: Dehradun

Declaration by Guide

This is to certify that **Mohan Subramanium** a student of MBA in logistics and supply chain management SAP ID **500065535** of UPES has completed this dissertation on "*Challenges in implementation of an ERP system - a Case Study*" under my supervision.

Further this is to certify that the work is based on the investigation made, data collected and analyzed by him and it has not been submitted to any other university or institution for award of any degree. In my opinion it is adequate in scope and utility, as a dissertation towards partial fulfillment for the award of degree of (MBA-LSCM).

Prof Vikas Kumar
Assistant Professor (SG)
College of Management & Economics
University of Petroleum & Energy Studies
Mobile: +91 9412877926
E-mail: vkumar@ddn.upes.ac.in

Date: 20/08/2019

Place : Dehradun

Declaration by Student

I Mohan Subramanium a student of MBA in logistics and supply chain management SAP ID 500065535 of UPES, declare that dissertation titled *"CHALLENGES IN IMPLEMENTATION OF AN ERP SYSTEM - A CASE STUDY* was carried out by me in partial fulfillment of the requirements for fulfillment of the requirements for MBA (logistics and supply chain management) of university of petroleum & energy studies Dehradun It is my original work and has not been submitted to any other organization for any purpose.

Mohan Subramanium

Place: Dehradun
Date : 30-09-2019

ABSTRACT

Many companies are adopting ERP systems worldwide. As ERP Systems are based on best practices, it is expected that adoption will bring benefits in Efficiency, Usability, Reduced Costs and Centralized Control. Businesses are subject to continuing changes. Change is uncomfortable, and adapting to change is messy. But change is vital-it defines life itself. The key is to learn how to embrace the changes that face both professionally and personally.

ERP covers the techniques and concepts employed for the integrated management of business as a whole, from the view point of the effective use of management resources, to improve the efficiency of an enterprise. That is, this technology attempts to integrate all departments and functions across a company onto a single computer system that can serve each different department's particular needs. ERP systems are nothing more than generic representations of the way a typical company does business. For a large percentage of ERP customers, ERP implementation was their most complicated and costly software project they have undertaken. Notwithstanding, patches and new releases create ongoing support and business adaptation challenges that can chip away from the returns on ERP investments. Unmanaged changes to ERP applications have generated some of the most recounted project horror stories. Needless to say, Change Management is becoming the focus of attention in many IT organizations. By equipping IT with the appropriate Application Change Management tools & processes, a more intelligent and deliberate change framework can be created that allows IT to facilitate, and in many cases even drive, business process change

Exploratory Research is used to learn and understand the problems faced by the management as well as the IT people while implementing an ERP package in ABC Corporation. For a large percentage of ERP customers, ERP implementation was their most complicated and costly software project they have undertaken. The study shows how by equipping IT with the appropriate Application Change Management tools & processes, a more intelligent and deliberate change framework can be created that allows IT to facilitate, and in many cases even drive, business process change.

Table of Contents

CHAPTER 1: INTRODUCTION

1.1 Background of the Study

Most organizations have yearned towards integrating their business processes and looked for a better way in which they can transform to effectively manage their businesses and attain World Class status. Separate systems were being maintained during 1960/70 for traditional business functions like Sales and Marketing, Finance, Human Resources, Manufacturing, and Supply Chain Management. These systems were often incongruent, hosted in different databases and required batch updates. It was difficult to manage business processes across business functions for example procurement to pay and sales to cash functions. ERP system grew to replace the islands of information by integrating these traditional business functions. The goal of integration was to use technology to develop process standardization across multiple business units in order to improve efficiency and generate greater return on capital.

In India, many organisations were attracted by promise to automate and integrate the core functionality of their organisations and provide timely information at the various levels of management and are increasingly adopting the system as a strategy to gain competitive advantage with employers looking for candidates who have vast knowledge in the area. The business environment is changing rapidly and in order to stay competitive in the market, organisations must adapt good strategies in order to remain relevant in the market place. Departments and functions in organisations must upgrade their capacity to record, process and communicate accurate and timely information for making economic decisions. Ansoff and McDonnell (1990) suggested the need to adapt as important otherwise the organisation will experience a misfit and success be difficult. Thus, ERP is perceived as an opportunity and amongst the good strategy that every organisation has to position itself to attain a competitive edge. However, with implementation of any strategy come challenges which have to be identified and measures formulated to deal with them accordingly.

1.2 The Concept of Enterprise Resource Planning

Enterprise resource planning (ERP) is the integrated management of core business processes, often in real-time and mediated by software and technology. ERP is usually referred to as a category of business-management software — typically a suite of integrated applications—that an organization can use to collect, store, manage, and interpret data from these many business activities.

ERP provides an integrated and continuously updated view of core business processes using common databases maintained by a database management system. ERP systems track business resources—cash, raw materials, production capacity—and the status of business commitments: orders, purchase orders, and payroll. The applications that make up the system share data across various departments (manufacturing, purchasing, sales, accounting, etc.) that provide the data. ERP facilitates information flow between all business functions and manages connections to outside stakeholders.

Enterprise system software is a multibillion-dollar industry that produces components supporting a variety of business functions. Though early ERP systems focused on large enterprises, smaller enterprises increasingly use ERP systems. The ERP system integrates varied organizational systems and facilitates error-free transactions and production, thereby enhancing the organization's efficiency. However, developing an ERP system differs from traditional system development. ERP systems run on a variety of computer hardware and network configurations, typically using a database as an information repository.

ERP systems experienced rapid growth in the 1990s. Because of the year 2000 problem and the introduction of the euro that disrupted legacy systems, many companies took the opportunity to replace their old systems with ERP.

ERP systems initially focused on automating back office functions that did not directly affect customers and the public. Front office functions, such as customer relationship management (CRM), dealt directly with customers, or e-business systems such as e-commerce, e-government, e-telecom, and e-finance—or supplier relationship management (SRM) became integrated later, when the internet simplified communicating with external parties.

"ERP II" was coined in 2000 in an article by Gartner Publications entitled ERP Is Dead—Long Live ERP II. It describes web–based software that provides real–time access to ERP systems to employees and partners (such as suppliers and customers). The ERP II role expands traditional ERP resource optimization and transaction processing. Rather than just manage buying, selling, etc.—ERP II leverages information in the resources under its management to help the enterprise collaborate with other enterprises. ERP II is more flexible than the first generation ERP. Rather than confine ERP system capabilities within the organization, it goes beyond the corporate walls to interact with other systems. Enterprise application suite is an alternate name for such systems. ERP II systems are typically used to enable collaborative initiatives such as supply chain management (SCM), customer relationship management (CRM), and business intelligence (BI) among business partner organizations through the use of various e-business technologies.

Developers now make more effort to integrate mobile devices with the ERP system. ERP vendors are extending ERP to these devices, along with other business applications. Technical stakes of modern ERP concern integration—hardware, applications, networking, supply chains. ERP now covers more functions and roles—including decision making, stakeholders' relationships, standardization, transparency, globalization, etc.

Figure 1.2. ERP core business processes

1.3 Change Management in ERP System Implementation

Simply put, widespread organizational change management (OCM) is critical to ERP system implementation success because an ERP system – and the changes it necessitates – affects every aspect of an organization. As a result, end-users across the spectrum are often overwhelmed with all the changes to their jobs, including new business processes, new data, new systems and new ways of interacting with all of the above. And since people tend to fear change, stress levels run high and emotions rule the day.

1. Present Information and Share Knowledge

Employees need more than training to understand the need for (and importance of) the new ERP system. At minimum, organizations must make efforts to communicate:

- Why the organization is implementing the ERP system
- How and when the ERP system will affect their jobs
- How the ERP system will improve their jobs
- How the ERP system will improve the company overall

2. Train and Educate

Organizations almost always underestimate the amount of education and training needed before, during and after implementation. It's obvious that ERP-related training is crucial to ensure employees learn the new software but it's also crucial to ensure they learn the new business processes. These changes in business processes, which are inherent in any successful ERP implementation, create changes in corporate culture and climate. Though less obvious, perhaps, than changes in job functions, these subtle shifts will be very important to your staff and must be managed to avoid resentment, fear and anxiety.

3. Show Support and Commitment from Senior Management

One of the best ways to rally the troops is to present a unified front. From the C-level down through the top management tiers, executives should be on point about the reasons behind and benefits of the ERP implementation. A lack of management buy-in is often a key reason behind

ERP implementation failures and resistance to change; do not think that an executive's disengagement or recalcitrance will go unnoticed by employees.

1.4 ERP Systems Implementation

From being a mere business management software program to being an integral part of a business, the ERP solution has come a long way not only in terms of smoothing the business process but also with boosting the business' overall growth. The complexities and multiple activities of businesses, cutting across all country and time zone borders inflict unwarranted chaos. It is here where an effective ERP solution with its far-reaching effect irons out chaos into a systemic design for continuous delivery of positive output for the company. It streamlines and accelerates the business process providing a competitive edge to the company. Below are the process for successful implementation of the ERP systems.

1 **Identify the problems / Set the objective(s)** - ERP provides a vast solution to many issues faced by companies. However, it is very important to identify the real objective for implementing ERP. The question is less about "should we implement" and but more about "what should ERP be implemented for". The Key Performance Indicators (KPI) have to be analyzed in order to understand the necessity of the software intervention. Key objectives are necessary; not only with respect to the present but also because future projections are included in the requisition list, which allows a business to factor in the scalability and accommodating changes in the future of the business/industry. So again, it is essential to identify the problem or the exact necessity motivating the ERP.

2 **Define scope/team** - The objectives can be many, ranging from bringing in the transparency of operations to having financial control, supporting organic expansion, supporting acquisition or supporting common processes. As per Panorama study, 61.1% of ERP implementations take longer than expected and 74.1% of ERP projects exceed budget. The primary cause of the delays and over budgeting is the unclear definition of the ERP requirement. The ERP features must be evaluated in accordance with the barometer of synchronization within the needs of company. Depending upon the budget and core necessity, the ERP demand list should be generated which achieves a smooth and hurdle less ERP implementation.

3 **Brainstorm/evaluate the ERP Products** - As per Capterra, approximately 33% of ERP buyers did not demo a product before buying it and approximately 22% of companies surveyed reported they bought the first system they looked at. These are dangerous statistics, not only for those who implement the ERP but also for the vendors, as optimal utilization of ERP software remains a dream. For successful utilization of ERP software, the management of the company has to invest its time in evaluating the options available. In the 2015 ERP report, it was found that 93% of the companies customized their ERP software to some degree according to their intended use. The customization could sometimes lead to an increase in the failure of the ERP system as it may increase the complexities. The organization needs to understand the difference between ERP package configuration and customization clearly because many times the requirement is fulfilled by the purchased of the ERP system and no customization is needed. Evaluating ERP options is a very important task, as options are to be evaluated based on current needs, as well as against future requirements. New additions, like cloud ERP solution or SaaS ERP, are the current preference of customers, as these options –are available in different scope and flexibilities to accommodate future requirements. Thus, a company needs to brainstorm with the ERP vendors/ consultants to bring in the best system in the organization.

4 **Data migration** - Once an ERP solution is identified, the next biggest and most important step is of data migration, which provides for a smooth transition and future utilization of the software. Implementing an ERP can be a huge change, especially if the company is trying the software for the first time. Identifying which data are necessary for successful transition to the common software problem is very important. Most software allows the input of data but entire data shifting may burden the software. Therefore, only the necessary and most important data should be transferred to the software, and great care should be taken to ensure that the data is retrieved from the software, whenever required.

5 **Check infrastructure** - Preparing the company for the ERP implementation is at the core of all of the steps of ERP implementation and plays a vital role in the process, be it a success or failure. After detailed brainstorming between the vendor and its management, the requisite infrastructure is installed. According to Mint Jutras, 23% are unable to grow their business as quickly as they would like and believe this to be because they lack the tools they need in their current ERP system. The infrastructure on which the software will run, has to have the

scope of scalability along with options to update as per the demand. Such requirement should not be limited.

6 **Customization** - ERP software is designed after a significant amount of research and according to the needs of the specific industry. In some cases, there may be no need for the customization. Implementing an ERP solution is a big investment decision by the company involving a large pool of resources, therefore, management has to continuously maintain tabs on the ERP software and maintenance schedule. During the pilot testing, management has to evaluate the realization of the value of the system against the desired value of the company. One should have a check on the system adopted by the company since its inception – so long as the company is following best practices OR it un-follows some unconventional/old methods regarding the ERP being fit-as-it-is-bought? These questions should be answered prior to customization as there is a chance that even before understanding the software, the system and making positive changes, and the need may never arise to customize the software.

7 **Change management** - Employees of any company are accustomed to the same kind of activities performed through a defined process in their daily routine and any changes may not be easily-accepted, especially when it is something as influential as ERP and that is when Change Management becomes crucial. ERP is not a fixed asset like a computer which is purchased and set up in the company office; it's actually a system that would change the environment and the working-style for the better, which affects not only one or two operations but all. Management should involve their employees and prepare them mentally to answer the critical questions like - Why is it important for the organization to include ERP? OR How would an ERP boost productivity? OR How would an ERP automate back-office functions and save time? A series of brainstorming sessions, updates on related developments and resolving queries would build employees' confidence and prepare them to welcome the good change with open arms. Change is for one and all and communicating this positively to the employees will make things easier as an ERP can only provide optimal results when every employee accepts the change. Therefore, care must be taken to ensure a smooth, yet successful transition by building employee consensus and confidence.

8 **Technology & Knowledge Transfer** - 21% of ERP implementations fail to deliver significant business benefits. The reasons vary, starting with improper customization for non-optimal software utilization resulting from ill-trained personnel operating/feeding data to the solution. Training is the most important aspect of the ERP software implementation process. It ensures there are fewer issues and more success, especially when ERP is implemented for the first time in the company or when the platform is changed from one ERP solution to another. The company's management must ensure proper vendor detailing and technological know-how to the company's in-house IT support staff. Proper use of technology and an effective knowledge transfer, along with proper training should be considered since they are the parties responsible for the entire project's success. Considering the consultant to be a part of the project would not only assist in a smooth and unhurdled operation, but would also reduce the time gap between the untimely glitch and the solution.

9 **Project management and Testing** - After evaluation of all available options, selecting the best-suited and then training the employees, the real aspect of implementation is the project implementation itself. According to a Panorama Research study, 40% of ERP implementations cause major operational disruptions after go-live; therefore, proper implementation is imperative. The rigidity may backfire since there are a lot of time gaps between the processes of selection, evaluation and implementation. . There is also a lateral improvisation which should be incorporated. Simultaneously, the core objective should not be diluted or changed. Testing is an important phase of the implementation process, which takes care of system and user acceptance testing.

10 **Final touch (go live) & on-going support** - Once the ERP solution is properly-checked and implemented, it is the time to go live. It is advisable to pursue one additional functionality test, just as a safety precaution. An ERP solution is not a one-time event, but rather a continuous process. It is something that the company has to continuously keep tabs on to avoid any aberrations or systemic glitches which could affect the ERP software functionality.

1.5. ERP Systems Implementation Challenges

1. The Selection Problem

Say a company has decided for many reasons to launch a managerial information system implementation project. The very first question that managers will face is what type, size, and scope of system they actually require and how to choose the most suitable solution among the hundreds of enterprise software options available on the market.

There is no single answer on how to find what you need, and there are multiple factors to consider on top of size, scope, and type, including price and specific functionality requirements (there are often hundreds to thousands of features and functions for each software system that each need to be considered in terms of priority and utility).

Many companies may consider themselves immune to this challenge as they have already decided what they need and want in a new system. Be careful about coming to this conclusion without proper background work though, as selecting a new software system, especially one as all-encompassing for a company as an ERP system, is one of the most complex and important decisions your company will ever make.

ERP selection should be considered as seriously as possible for the reason that ERP system choice predefines a company's strategy for at least the following 6 to 10 years and, no doubt has a huge impact on the future success of the entire business.

2. Technical Issues

How to successfully select a software package is important but not the last problem that will appear on the thorny path toward getting the whole system (software and hardware, server, and users) working together and bringing any value back to the company. Another set of implementation issues is related to the technical part of the project.

More than likely servers and workstations will need to be revised to accommodate the new system, and new and more modern ones may need to be ordered, purchased, and replaced. The internal network also has to be analyzed and modernized if required, and the speed and

bandwidth of the existing Internet access should be taken into consideration along with possible technical concerns about the mobile devices being used.

If these needs are underestimated, they can dramatically impact the overall results of the project (and easily delay the "happy hour" once the new system is finally in place and working as planned), or poison the first few weeks (or even months) of using a new system with slow performance, resulting in a slackening of the existing pace of business.

However, changes during the last few years in delivery models have caused a shift in how ERP and other types of organizational software are made available to users.

Plenty of "as a service" and in the cloud options have become available, offering hosted infrastructure, data storage and software services, which now allow the cost and headache of applications, hardware, network, and storage problems to be minimized. These include software as a service (SaaS), platform as a service (PaaS), and infrastructure as a service (IaaS).

With an on-premise environment, everything is hosted on-site—data, applications, servers, network, and software solutions. With "as a service" hosting or cloud option, data, middleware, networks, hardware, and applications can be hosted on or offsite depending on the service model chosen

3. Data Quality Issues

This issue is particularly symptomatic of companies that are implementing ERP for the first time and transferring their legacy data into the new system from Excel spreadsheets, manual records, or old disparate applications. Basically, the issue is that old data that have been used and stored for years can for many reasons appear approximate or even incorrect in the new ERP reality. In fact, according to our research, replacing a legacy system and consolidating disparate solutions are the top two common challenges companies face.

For example, take this situation from my previous work experience (during an ERP implementation project for a midsize metal manufacturer): in the middle of the project, we converted existing bills of materials (BOMs), BOM routings, and hour tariffs into the new

system and realized that the products' new lead times exceeded real ones by a factor of two or more.

Thanks to adequate time allotted for the conversion phase during project planning, we had some time to fix the data by dedicating engineers and analysts to this task full-time for a few months and modifying the implementation plan accordingly; but even in this case, the project was delayed for two months. So, be careful with your old information, as it can be far from reflecting the current reality, and always make "pilot" tests of new system outputs using legacy data before converting or transferring all the data over to the new system.

4. Business Philosophy Changes

ERP implementation brings significant changes to a company's conventional business model and the day-to-day practices it has been using for years or even decades. Take these examples of likely changes to business processes with a new ERP:

- some employees' level of responsibility is dramatically increased, as with the new system it is more difficult (sometimes impossible) to fix erroneous data or typing errors;
- new approaches to data reporting and mining and, thus, new managerial principles and practices have to be established; and
- business models and business processes might require massive changes because of new real-time opportunities and data availability.

These are only a few examples of how serious and meaningful business transformation can be, post-implementation.

Using wise and forward-looking ideas and conceptions when implementing ERP, it is definitely possible to get a return that is something much more appreciable than a simple change in format of data or an updated user interface. This is a real challenge, but at the same time it is a great opportunity to refresh the business and bring new ideas as well as laying a strategic foundation for your organization's future.

5. "Mindshift" Issues

This is the most difficult type of issue to resolve. It's easy to forget that the success of the implementation of a software system depends mainly upon the users. The system itself is a non-

living and logical entity that follows logical steps and processes as it has been programmed to, but the users of the system are humans who were used to processes with software being one way and will more than likely find it hard to switch to a new way of doing things, especially if the benefit of the new methods is not immediately obvious or forthcoming.

This is an ERP project manager's "favorite" variety of problem (meaning their worst nightmare), arising from users' habits and their understanding of what is good for the business in general and for the user in particular. "It's always been like this, long before you came in," "I don't think it will ever work," "It's not working on my PC," "I will be talking with the CEO about this system," or "You don't understand how it should work"—these comments should sound familiar to anyone who's ever tried to implement a new system or change users' requirements.

It is really difficult to describe or classify the possible problems that can arise among the user base when a new enterprise software system is implemented; actually, almost any question can appear. Unfortunately, change is hard to accept without seeing the visible advantages of it, and if you don't take steps to help your employees see these advantages before the implementation begins you will likely regret it later. I would recommend trying to predict such problems at the planning stage in order to reduce the potential negative impact of users' contra-collaboration activities.

Also, gaining the interest of different groups and categories of system users well ahead of the project's start date and keeping them involved during the implementation will help to encourage the "mindshift" required in your employees for a successful implementation. Consider following these steps to keep employees informed and engaged before, during, and after a big software implementation project:

- inform all employees of news and project milestones as the project progresses
- establish reliable feedback communication channels for employees
- stimulate employees to generate new ideas and provide suggestions
- organize interesting and promising training sessions
- celebrate the best user achievements in training and with the new software system

Affected employees at all levels must become allies to the ERP project team for a new system implementation, as ignoring users' experience and concerns puts in doubt the success of the entire project and can kill any excellent undertakings.

1.6. Research Problem

Many organizations have shifted to this system because of numerous reasons including; ineffective communication channels, improper systems, indefinite structures and bizarre organizational cultures amongst others. A number of organizations have reaped the benefits of ERP while others are still on their way to cope. Adopting a new system has its perceived benefits expected and what it actually delivers. Challenges are many, including resistance by the employees and the cost of undertaking the initiative. The cost is not limited to purchase of the software from the vendors but the overall cost of managing change and adopting new hardware and employees to support the system, the training cost can also be a challenge. Little research has been conducted to compare the implementation practices of ERP in developed versus developing countries. Implementation is likely to be more problematic in less developed country like India. ERP technology faces additional challenges in developing countries related to economic, cultural, and basic infrastructure issues.

The last two decades has heard a lot of changes in Indian economy mainly due to liberalization, globalization and technological advancement. Many organisations in India are increasingly adopting ERP software due to the benefits which the software is promising and to eliminate weaknesses associated with the legacy systems. These companies are adopting the systems without assessing the experiences of organisations in similar environment (India). So as to help other organisations seeking to implement the software to avoid making similar mistakes which other organisations have made this research seeked to determine the challenges in the ERP implementation and ways to eliminate them.

Planning system implementation in India found out that most of the challenges were related to people and process factors, lack of proper change management, lack of proper training to the employees, poor vendor support and lack of user involvement.The motive for undertaking this research was to add to the known literature on the ERP implementation challenges in organisations in India.

There are several reasons of success and failure of ERP implementations. Some of the reasons cited in the literature are lack of support of top management support, resistance from

employees, poor selection of ERP systems .This research seeked to explore the challenges that face organisations today by answering the following questions; what are the challenges of ERP implementation facing the organisations in India ? What are the measures undertaken by these organisations to deal with the challenges?

1.7 Objectives of Study

Primary objective

- ✓ Challenges in implementation of an ERP system at ABC Corporation.

Secondary objectives

- ✓ To study about the ERP applications
- ✓ To study various steps of ERP implementation.
- ✓ To study carious challenges in ERP implementation and its solution.

1.8. Value of the Study

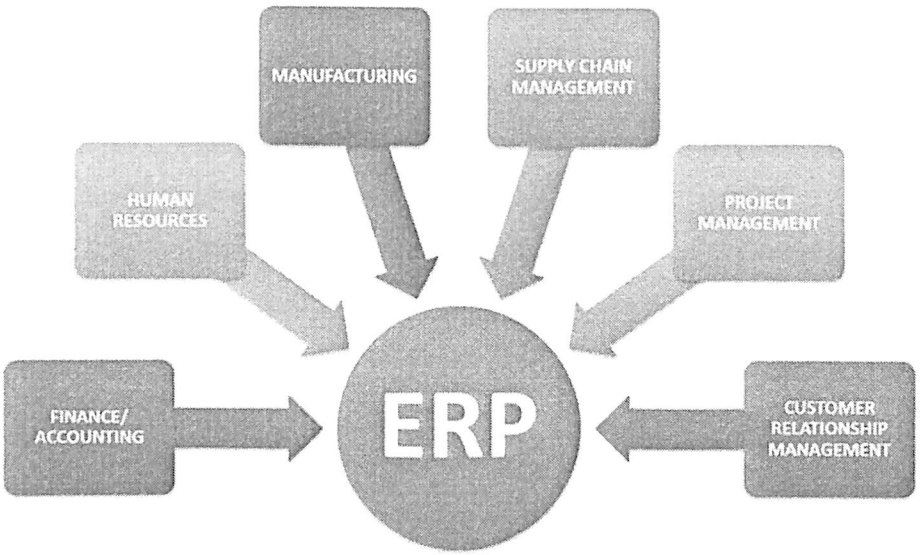
This research would benefit the various stakeholders in the area. First, this research would aid the managers of the surveyed organisations to understand the specific challenges that are faced in the ERP implementation process and how to handle them so that they can meet their objectives.

The other beneficiary of this research would be the potential investors in the software but who are reluctant due to the fact that they have not heard of an exhaustive research in the area and fear the loss and challenges associated with adoption of the software which they have little knowledge.

The study could also be used for future reference for academicians who would undertake further research studies on the area. Furthermore, these practical outcomes would build and contribute to the current literature on the research topic since very few have researched widely on this topic. It would aid in investigating the influence of context, validating previous research, facilitating theory building and contributing to the existing body of knowledge in the area of ERP implementation.

CHAPTER 2: LITERATURE REVIEW

2.1. Introduction



Enterprise Resource planning systems integrate all data & processes of an organisation into a unified system. A typical ERP system will use multiple components of computers software & hardware to achieve the integration. A key ingredient of most ERP systems is the use of a unified database to store data for the various system modules.

The term ERP originally implied systems designed to plan the use of enterprise-wide resources. Although the acronym ERP originated in the manufacturing environment, today's use of the term ERP systems has much broader scope. ERP systems typically attempt to cover all basic functions of an organization, regardless of the organization's business or charter. Business, non-profit organizations, non-governmental organizations, governments, and other large entities utilize ERP systems.

The introduction of an ERP system to replace two or more independent applications eliminates the need for external interfaces previously required between systems, and provides additional benefits that range from standardization and lower maintenance to easier and/or greater reporting capabilities.

Examples of modules in an ERP which formerly would have been stand-alone applications include: Manufacturing, Supply Chain, Financials, Customer Relationship Management (CRM), Human Resources, and Warehouse Management.

ERP packages are integrated software packages covering all business functions like sales and distribution, production & planning, financial Management, Human Resource Management etc. Industry analysts are forecasting growth rates of more than 45% for at least the next 5 years. Why are so many companies replacing their key business systems? The answer is, ERP Allows easier global integration: barriers of currency exchange rates, language and culture can be bridged automatically, so data can be integrated.

- Improve decision-making activities.
- Increase competitive advantage by integrating people and data.
- Allows management to manage operations not just control them.
- Centralize control and Affect competitor's behavior. ERP has diffused many "best practice" processes into the system.

Enterprise Resource Planning (ERP) systems have fundamentally changed the work of IT organizations. The sheer size and complexity of ERP implementations makes managing these projects difficult. There are really two basic sides to ERP management, people and technology. An ERP package touches the entire organization and can affect nearly every employee. And in some cases, an ERP project manager may not be able to know who will be affected, which can lead to some nasty surprises.

An ERP system is a single integrated software package that runs off a single database so that various departments can easily share information and communicate. ERP is a tool that will:

- Enable access to real time and shared information
- Give greater visibility of data that will drive improved productivity, efficiency and market intelligence
- Reduce integration complexity and cost of ownership

- Provide process improvement along the value chain
- Support the business strategy

This technology attempts to integrate all departments and functions across a company onto a single computer system that can serve each different department's particular needs. ERP systems are nothing more than generic representations of the way a typical company does business. ERP's enable automating the tasks involved in performing a business process so it is integral that implementers start with a clear articulation of the business problems being addressed. The most common reason that companies walk away from multimillion dollar ERP projects is that they discover that the software does not support one of their important business processes. Not only do the business functions need to be identified, the more subtle issues such as the company's corporate culture and management

ERP systems stress the importance of accountability, responsibility and communication within an organization. They focus on optimizing the way things are done internally rather than with customers, suppliers or partners.

For a large percentage of ERP customers, ERP implementation was their most complicated and costly software project they have undertaken. Companies have made big investments in ERP software, and leading CEO's now want to see IT contributing more to the bottom line – producing higher value at lower cost. Notwithstanding, patches and new releases create ongoing support and business adaptation challenges that can chip away from the returns on ERP investments. Unmanaged changes to ERP applications have generated some of the most recounted project horror stories. Needless to say, Change Management is becoming the focus of attention in many IT organizations.

By equipping It with appropriate Change Management tools and processes, a more intelligent and deliberate change framework can be created that allows IT to facilitate, and in many cases even drive business process change. Sometimes changes are a result of problems with the programs or processes. Sometimes changes are spurred by the desire for enhancements.

Sometimes they are simply the result of not having all settings or functionality available as originally planned.

For example, changes in SAP can come in the form of program code fixes and updates, customization changes, master data changes, or even upgrades and fixes delivered directly from SAP. The most essential and effective change management tool in SAP is the Correction and Transport System. SAP has done a good job in providing for the eventuality of change and this tool is an extremely effective source of change control.

2.2. Key Success Factors for ERP

- **A clear strategic vision** - The evaluation and project team must be able to translate the strategic business vision in to clear scope across the enterprise and maintain it during implementation. This is more than simply ensuring a ROI. It encompass future flexibility, step improvements in business processes, long term incremental improvements and identifying where the business core strengths already exist.

- **Senior Sponsorship across the business** – The project must not rely on one sponsor, buy-in must be across the whole executive layer. The philosophy must consist of a "win win" mindset. The ability to see the big picture rather than a silo embodies ERP. From this position will come success from integration and data management.

- **An Empowered Team** – The project team must consist of the best from the business who can embrace change and are an investment in the future state. Team members require stamina, business knowledge and the ability to influence peer groups. Clear project management and direction is critical to maintain pace and moral during the varied conditions of an ERP project life cycle.

- **Change Management** – Managing organisational change is essential to an ERP solution being delivered on time across the Organisation. This must build real

ownership and develop a pull from the business. Quality in training is an essential ingredient to developing an informed and confident user community.

- **Relationships and Technical Excellence** - The implementation is dependent upon a strong client/partner relationship that has mutual respect for the expertise in technical and business excellence. This must encompass the use of best practice and the ability to listen and act upon advice in two way open communication.

2.3. The Significance and Benefits of ERP Software and Systems

The significance of ERP lies in its many benefits. Integrated information systems can lead to more efficient business processes that costless than those in un-integrated systems. ERP systems have these benefits as well:

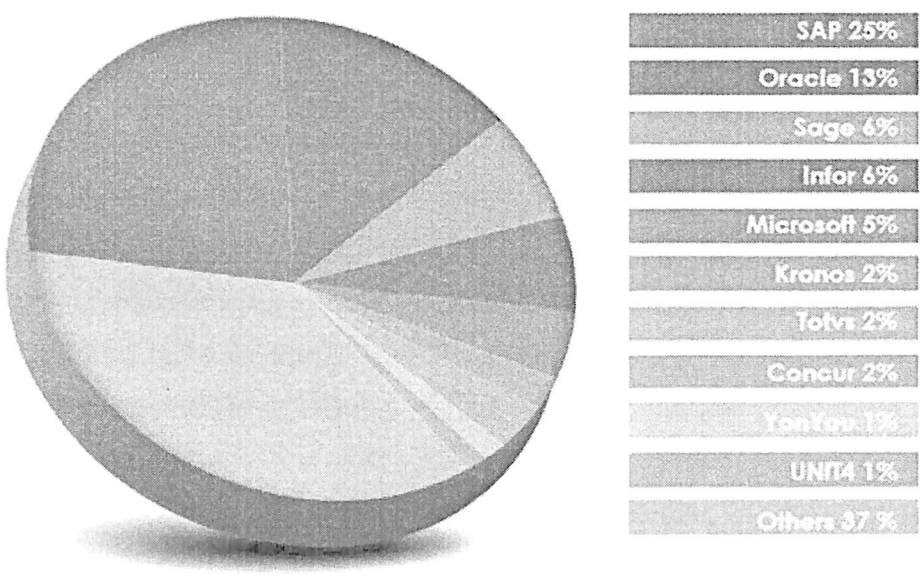
- ERP allows easier global integration: Barriers of currency exchange rates, language and culture can be bridged automatically, so data can be integrated.
- ERP not only integrates people and data, but it also eliminates updating and repairing many separate computer systems. For example, Boeing had 450 data systems that fed data into its production processes. The company now has a single way to record production data.
- ERP allows management to manage operations, not just monitor them. For example, without ERP, getting an answer to "How are we doing?" require getting data from each business unit and then putting the data together for a comprehensive, integrated picture. The ERP system already has all the data, allowing the manager to focus on "What are we going to do better?" This enhances management of the company as a whole, and makes the organization more responsive when change is required.
- Tighter controls for financial compliance declaration (e.g. Sarbanes-Oxley and Basel II) as well as other forms of compliance reporting.
- The single data source for product and services information - such as information related to suppliers, vendors, customer orders and the products themselves - drive rapid product development and launch cycles which increases a company's overall

market share.

- Increased access to valuable corporate data delivers a clear, global view of the business that drives continuous improvement strategies and establishes common performance metrics and measures to gauge the health of the business.
- Effectively managing projects holistically fosters decision making at critical levels in the development and/or manufacturing process.
- Support for streamlined sourcing and procurement processes drive alignment to customer demands, and also deliver a centralized buying model to reduce unauthorized and unnecessary expenses.
- Providing sales and operations planning with access to critical information fosters "closed loop" processes that ensures the business does not overpromise and/or underdeliver to customers.
- Automating business processes such as invoicing and sales and purchase orders within one systems improves forecasting accuracy and reduces inefficiencies.
- Using a single base of information for billing and other customer interactions improves service levels and increases customer retention.

2.4. ERP Software Market Share

Global ERP Software Market is expected to garner $41.69 billion by 2020, registering a CAGR of 7.2% during the forecast period 2014 - 2020. Enterprise resource planning (ERP) is a software that allows organizations to manage their business processes. The role of ERP has transitioned from back office activities to the integration of business processes.



Conventionally ERP software has been extensively used for back office operations, which include production, accounting, inventory control and order management etc. An ERP software consists of multiple software modules and each ERP module is focused on a single area of business process such as material purchasing, inventory control, accounting, finance, HR and marketing etc. These modules can be prepared in accordance to the requirement of the company. ERP software is deployed either as an on premise or cloud based software.

Managing resources efficiently and integration of organizational activities are some of the major features of ERP software. Implementation of ERP increases operational efficiency, consequentially providing the competitive edge to businesses. Increasing operational complexity and rapid changes in business models are some of the major challenges faced by

present day businesses. To overcome these challenges, business organizations are rapidly adopting ERP software.

Furthermore, growing competition compels organizations to adopt ERP software in order to remain competitive in the ERP Software market. The demand for ERP software's is expected to grow swiftly in the forecast period, owing to its importance in supplementing and synchronizing a company's business processes. High implementation cost, availability of open source applications and tough competition are some of the major challenges in the ERP Software market. Cloud ERP software would open-up numerous opportunities for the market as it renders more flexibility to the businesses.

The key driver behind adoption of ERP software market is to enhance operational efficiency and transparency within the organization. High penetration of cloud based deployment model is boosting the ERP Software market growth. However, some of the restraints affecting the business are high cost and the availability of open source applications.

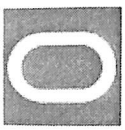
Furthermore, integrated system architecture is a major component of the system as this integration trait enables an enterprise to access the same system across different demographics. This software is also responsible for increasing productivity by reducing expenses and enabling the enterprises to get potential ROI. The software can integrate high volume of data as well as processes across a many departments and geographies. It further empowers an enterprise to move their products much quicker, reconcile shipments faster and so on. Nonetheless, the enterprise resource planning software provides organizations access to a multitude of crucial company data. Earlier such data were either unavailable or impossible to derive with other software.

2.5. Enterprise Resource Planning Software

SAP ERP - Leverage world-class ERP software. Sharpen your competitive edge and drive growth with enterprise resource planning from SAP. With more than 40 years of experience and nearly 50,000 customers, our market-leading enterprise resource planning (ERP) software is a proven, trusted foundation built to support the worlds largest organizations as well as small and midsize companies in 25 different industries. Leverage role-based access to critical data, applications, and analytical tools and streamline your processes across procurement, manufacturing, service, sales, finance, and HR

ORACLE
NETSUITE

Oracle NetSuite is the world's #1 cloud ERP solution. The NetSuite ERP provides over 40,000 organizations across 160+ countries worldwide with a modern, scalable, and unified business management platform. Harness the power of automation by streamlining all your crucial back-office processes, from accounting and financial planning, to warehouse management, e-commerce, inventory planning, and beyond. As a comprehensive, flexible suite of solutions designed to grow with you, NetSuite is truly the first and last business management solution your business will ever need



PeopleSoft - Oracle's PeopleSoft applications are designed to address the most complex business requirements. They provide comprehensive business and industry solutions, enabling organizations to increase productivity, accelerate business performance, and provide a lower cost of ownership.

Munis® provides a comprehensive ERP suite encompassing financials, human resources, asset management, and revenues. It is designed to meet the various public sector organizations such as counties, cities, school districts, and authorities. Munis is functionally rich and leverages the latest technologies to integrate data and increase efficiency and productivity across an organization. Tyler's Munis ERP software offers the best return on investment available in the market today.

Microsoft Dynamics NAV (formerly Navision) is business management software that delivers comprehensive business management functionality, from financials to your supply chain to manufacturing and more. It connects the many moving parts of your organization, giving you better visibility into and control over what's going on in your business. And it supports highly specific industries with powerful solutions created by Microsoft partners.

EPICOR

Epicor Software Corporation drives business growth. We provide flexible, industry-specific software that is designed to fit the precise needs of our manufacturing customers. More than 40 years of experience with our customers' unique business processes and operational requirements is built into every solution-in the cloud, hosted, or on premises. With a deep understanding of your industry, Epicor solutions spur growth while managing complexity. With margins for products eroding, customer demands increasing, and the world in a state of uncertainty, manufacturers must leverage technology to increase business agility, enable insightful decision-making, and achieve even more at the fastest pace.

2.6. ERP Software Selection Criteria

In the midst of purchasing an ERP system, there are multiple decision points and numerous factors. Where to begin? What are the primary selection criteria that you and your team need to know before you start? As you embark on this task, here are six key considerations to guide you as you try to determine the best ERP solution for your business:

1. Company goals and objectives

The primary reason to change to a new ERP system is to support your company's goals. Every company has different objectives. Some examples might be:

- Growth goals: Can I double my business with the resources that I have?
- Efficiency goals: Can I task and process redundancy, so that each element needs to occur just once, and multiple tasks can be folded together?
- Speed to market goals: Can I bring my product to market faster, satisfying all regulatory requirements, and thereby gain market share faster?

2. Functional software requirements

Sure, all companies share general operations: accounting and marketing, for example. But In terms of function, your specific industry will dictate the details. The needs of your company will govern the features that are most important to you. Be mindful of all the functions that occur in an average business day, and aim to review all the areas on the list even if your current processes are currently being done "outside of the system" on spreadsheets or whiteboards. This is the one time when it's good to sweat the small stuff.

3. Underlying technology and future scalability

There was a time where the underlying technology of an ERP system was not really a primary consideration. Software functionality dominated when choosing a new system. But technology moves too fast. The cost of changing an ERP system includes much more than the price of the software, it includes business disruption, training, and lost time. Choosing a system that is based on newer technology will give you more longevity in the long run and will make a better investment. Look under the hood.

4. Budget and resources

There is a big variation in the price of ERP software. The highest priced system may be five times the cost of the least expensive solution. There is a reason for this. Some companies need the advanced functionality built into a higher priced system, but others may have less complex criteria and can choose a more moderately priced ERP solution. Don't necessarily think more expensive is better. There is a cost to running each type of system. A higher priced system might be designed for companies with single task individuals. These systems break out functions into small pieces. A smaller company with individuals that multi-task, might find they are doing lots of extra steps and are actually decreasing efficiency with the more expensive system.

5. A team you trust

Who will implement this system? Who will manage this project? Who will support it when needs and/or processes change? The choice of people, both internal and external, is probably the most critical to the success of this project.

In a study done by Deloitte & Touche, businesses looking for a new system were asked to name the top ten criteria they used for their selection. Those who were buying their first system were tallied separately from businesses buying their second. Responses were ranked in order of importance. The results are summarized below:

Table 2.6 First Time and Second Buyers comparison

First-Time Buyers	Second Time Buyers
Price of Software	Level of support provided by reseller
Ease of Implementation	Developer's track record of performance
Ease of Use	Ability to fit to business
Ability to fit to business	Growth potential
Functionality	Price of Software
Ability to work with existing hardware	Quality of documentation
Growth potential	Functionality
Level of support provided by reseller	Ease of Use
Quality of documentation	Ease of Implementation
Developer's track record of performance	Ability to work with existing hardware

One would think second-time buyers would be "smarter", if for no other reason than they have the experience first-time buyers lack. It stands to reason their rankings would be a better guide to what really matters when researching ERP system options. Therefore, a quality consultant is a critical factor – after all, anyone can sell the product, but can just anyone support your needs? Partner with a consulting company that has long term customers.

6. Define the process

This is the part everyone dreads. Meetings, demos and research tend to generate more questions than answers. A team approach may help the process, but it could also slow things down. It's best to decide who's in on the decision making team before you get started. Consider the needs of the all the stakeholders and don't let any one group overshadow the needs of the rest of the organization. Accounting / Finance, Distribution, Manufacturing, IT, Human Resources, Procurement, Sales, Marketing and Executive Management all have different views as to what they think is critical. Listen to the various groups but don't get too bogged down with any one individual's needs. These can usually be accommodated.

2.7. ERP Implementation Strategies

When implementing an enterprise resource planning (ERP) system, top management commonly faces an unwanted attitude from potential users for one reason or another, they resist the implementation process. Top management should, therefore, proactively deal with this problem instead of reactively confronting it. The enterprise resource planning (ERP) system is an integrated set of programs that provides support for core organizational activities such as manufacturing and logistics, finance and accounting, sales and marketing, and human resources. An ERP system helps the different parts of the organization share data and knowledge, reduce costs, and improve management of business processes.

In spite of their benefits, many ERP systems fail. Many ERP systems face implementation difficulties because of workers' resistance. Effective implementation of ERP requires establishing five core competencies, among which is the use of change management

strategies to promote the infusion of ERP in the workplace. Although some studies tried to address this problem by identifying change management strategies that facilitate the success of ERP implementation, many ERP systems still face resistance, and ultimately, failure. Another stream of research that also deals with the introduction of new products (or ideas) puts forth a different story. Despite the large number of new products and services that they introduce every year, marketers can still achieve high rates of success. The answer rests in the strategies and techniques employed by marketing professionals.

A quick review of ERP research revealed different strategies for implementing ERP successfully.

One can classify these strategies into

1. Organizational strategies,
2. Technical strategies, and
3. People strategies.

Organizational strategies for promoting ERP implementation success include.

- Change strategy development and deployment,
- Change management techniques,
- Project management,
- Organizational structure and resources,
- Managerial style and ideology,
- Communication and coordination, and
- IS function characteristics.
- Some of the technical strategies that have been proposed to determine ERP success include
- Technical aspects of ERP installation,
- ERP complexity,
- Adequacy of in-house technical expertise, and
- Time and cost of implementation.

- Examples of people strategies for promoting ERP implementation success include
- Staff and management attitudes,
- Involvement, and
- Training.

2.8. ERP implementation challenges

Enterprise resource planning (ERP) system enables an organisation to integrate all its primary business processes in order to enhance efficiency and maintain a competitive position. Successful implementation of ERP system enables an organisation to realise benefits in terms of improved productivity and competitive advantage. Literature suggest that though ERP systems have been implemented all over the world by many companies but understanding and implementing ERP is a challenging task as there is high cost and risk involved. Since ERP implementation affects entire organisation such as process, people, and culture, there are a number of challenges that companies may encounter in implementing ERP systems.

Since implementing ERP system requires a substantial capital investment, organisations expect successful outcomes so that organisation's targets are achieved. This study investigates through literature review the ERP implementation challenges faced by organisations so that the lessons learned in the past can be helpful to organisations to proactively plan for mitigating risks and successful implementation on time and not causing cost and schedule overrun. As a lack of awareness of numerous and varied challenging issues surrounding the implementation process could be problematic for the whole process this report will not only be useful to researchers but also to industry leaders who are interested in understanding the recent trends and the impact of emerging technologies on ERP implementation approach and methodology.

2.9. ERP implementation technology selection challenges

ERP technology selection is a crucial and paramount consideration for enterprise level decision makers in organisations aspiring to sustain staying competitive since, it is a serious investment decision.

As investment in ERP systems implementations projects in organisations are strategic and highly risky because of the complexity involved, high implementation cost and change management issues it is crucial to select an ERP software that fits with organisational goals and objectives for successful implementation.

Radut and Codreanu (2012) argued that the most important part of adopting an ERP system is the selection part and the selection process should be specific to organisation as it takes into account the requirements of the organisation and should be an analytical method based on criteria. The most important of which are functionality, technology and expertise, flexibility and application scalability, costs, implementation and ease of use. Their offering is a simple sequential qualitative model with selection criteria/characteristics composed of six attributes, namely functionality, reliability, efficiency, usability, maintainability, and portability.

Johansson et al. (2011) studied relationship between factors influencing selection of implementation approach and companies' ability to stay within budget when implementing ERPs. The main findings are that:

- the number of implemented modules influences selection of an implementation approach
- companies with information strategies are more likely to stay within budget regarding ERP systems implementation.

Garg and Khurana (2013) presented the ERP product selection criteria for Indian SMEs. The finding of this research will help the marketing and sales team of ERP product companies to

improve upon the key points and also enable end users to make informed decisions in selecting the ERP package for the organisation.

Ratkevicius et al. (2012) presented analysis of different classifications of the fundamental criteria for the ERP system selection process, and defines two main groups – software-related, and implementation-related. The significance of ERP system functionality as the principal software-related ERP selection criterion is emphasised. Eleven other criteria were defined as important to consider, such as the total costs of the ERP implementation project, vendor reputation, ERP reliability, ease of integration with other systems, technology advance, scalability, upgrading ability, customisation/parameterisation possibilities; ease of use; flexibility and modularity. The importance of all-round knowledge for a successful ERP implementation is emphasised including ERP software functionality, project and change management, business processes, organisation of training etc. All these areas are closely connected with implementation-related ERP selection factors: organisational fit, end-user readiness, training, system support quality.

Kazemi et al. (2014) presented ERP system criteria based on opinions of the project expert team and tried to select the best vendor option of ERP system and determine a suitable ERP package for enterprise using multi-criteria decision making technique and combining them with goal programming and fuzzy theory. Cebeci (2009) presented a case study on approach to select a suitable ERP system for an industry having challenges of variant structure of products, production variety and unqualified human resources and proposed to match the ERP package objectives with the business objectives and also provided an analytical tool to select the most suitable ERP software. In this study, a fuzzy extension of the multi-criteria decision-making technique analytic hierarchy process (AHP), was used to compare these ERP system solutions.

2.10. Change management challenges in ERP implementation

Before implementing an ERP system, business enterprises analyse organisational strategy, structure, culture, and operations. Making an organisation and ERP system compatible may require the organisation to change some or all of the afore mentioned facets of the business. This drives change to business process, which means people must also change. If change management is not handled well, ERP projects are apt to fail. In fact, most ERP failures are blamed on people issues rather than technology issues. People, process and technology are the three drivers of change management for ERP projects.

Hurt (2011) relates in the case study several established management and information systems concepts: the value chain, expectancy theory, change management principles, the capability maturity model and the systems development life cycle. They relate eight competencies required for successful change management based on literature of Crawford and Nahmias (2010) especially to ERP projects. These competencies are leadership, stakeholder management, planning, team selection/team development, communication; decision making and problem solving, cultural management and project management.

Al-Shamlan and Al-Mudimigh (2011) discussed that the top management usually faces an unexpected attitude from potential users during implementing an ERP system. As their resistance may cause failure of project top management should deal with this problem using effective change management strategies and processes. They also provided a very significant and very explicit contribution towards the change management factors for ERP implementation.

Madapusi and D'Souza (2012) presented a literature-based and theory-driven model developed to examine the relationship between ERP system implementation and operational performance and also influence on operational performance. A better understanding of the contribution of ERP systems to operational performance can be obtained if researchers address and assess changes at modular and system level also the use of longitudinal designs to capture and tease out the time delayed effects between ERP system fine-tuning (at the module and sub-module levels) as well as changes in operational performance.

Adams and Martin (2011) in the web paper discusses in detail role of change management to address the People aspect in an ERP implementation project, realise the path for delivering the new processes and ERP solution into production operations, and gain 'reach' into the organisation. It also addresses how resistance to change affects ERP implementation and how to mitigate these challenges. The paper also stresses the importance of organisation alignment, skill assessment, training requirement during the project execution.

Kwak et al. (2012) conceptualises an alternative view of users' ERP acceptance model. This study incorporates the best practices of ERP system implementation projects, internal support, external (consultant) support, and functionality selection, into the extended technology acceptance model (TAM) that includes belief constructs and socio environmental construct (subjective norm)

Reddi and Moon (2011) presented a service-oriented architecture (SOA)-based framework to carryout engineering change management (ECM) across a supply chain. Each service in the SOA framework accomplishes an independent task, then performs a set of tasks constituting a business process. This framework enables the interaction between the partner's information systems in a communication backbone to achieve an effective ECM over a collaborative network of product development.

Hofton et al. (2012) has identified the critical people-related challenges organisations typically face at each phase of an ERP implementation, as well as specific steps to take to mitigate them. With so much on the line, consider what your organisation should plan to minimise risk and make the ERP project implementation journey as smooth as possible. It presents the top ten change management challenges and also provides guidance for mitigating the same.

Krigsman (2012) in his paper discusses transforming the business using cloud-based ERP and explores the important role of professional services when implementing cloud ERP. The

author also offers suggestions to encourage cloud ERP adoption, an important foundation to create business transformation that endures.

2.11. Knowledge management challenges in ERP implementation

The simultaneous implementation of ERP and knowledge management systems in organisations implies some sort of challenges. While ERP systems are meant to increase the organisational efficiency by enhancing the information processing capability of the enterprise knowledge management initiatives aim at mobilising the knowledge through organised knowledge repositories of explicit knowledge and communities of practice as a means of sharing and creating tacit knowledge, having their overall focus on improving innovation capabilities by increasing flexibility.

Zakari and Ahmad (2012) in the paper identify two major areas of concern regarding the management of knowledge in their study: managing tacit knowledge, and issues regarding the process-based nature of organisational knowledge viewed through the lens of organisational memory. The competitive advantage of organisation arises from its capabilities in internalising and integrating the adopted processes with the existing knowledge paradigms and harmonising the new system and the organisational culture towards getting the most out of the implementation effort.

Sedera and Gable (2010) presented the research model, illustrating the hypothesised relationship between knowledge management (KM)-competence and enterprise system (ES-success) and argued that the higher the organisation's level of ES-related KM-competence, the higher will be the level of success of the enterprise system. Consistent with the literature reviewed they argue that the four knowledge management phases (i.e. creation, transfer, retention, and application) are distinct yet interrelated, with competence in each phase contributing to overall KM-competence in the organisation.

2.12. Emerging technologies and future proof challenges in ERP implementation

Organisations are under constant pressure from customers, shareholders, and suppliers to continuously improve and make better products quickly and efficiently. Competing in a dynamic environment and meeting global challenges requires agility. Successful companies must be able to respond quickly and cost-effectively to change. Organisations need to convert their industries into responsive, demand-driven, profit-making enterprises by optimising their operations. Their competitive advantage and ultimate survival depend on the use of extended information system applications and/or technology. This has led to an increasing interest among vendors to improve future ERP-systems to support the end-customer organisation even better using emerging technologies.

- The emerging technologies will introduce new levels of process flexibility, improve the transparency of ownership costs, and accelerate the speed of process execution. Below is a brief introduction of each of the above listed extended information system applications and/or technology. Through exhaustive literature survey the following emerging technologies are identified in report by Hammerman (2011):
- Software as service (SaaS) – and, more broadly, cloud computing – represents an alternative deployment model that is much more predictable. SaaS or cloud deployment models will change application economics.
- Mobile technology including devices, software, networks and product distribution channels is evolving at breakneck pace. The potential of mobile applications to transform business processes hinges not only on the speed and convenience of mobility itself, but also on the unique capabilities of the devices to sense, respond to, deliver and capture information in real time.
- Package configuration tooling that is flexible, graphical and model-based – no coding required – is evolving and will become a way to differentiate between packaged application suppliers. Building out these capabilities may prove challenging, given the high degree of flexibility, variability and adaptability built into business process modelling (BPM) services.

- Platform-as-a-service (PaaS), a set of rapid application development tools for extending apps to the cloud, disrupts the notion of 'build versus buy' in applications. Instead of build versus buy, the application platform will enable 'buy plus build'. Standard functionality plus PaaS extensibility means that ERP and other complex applications can be more effectively aligned with business requirements.
- Elastic application platform (EAP) are emerging as an application platform that automates the elasticity of transactions, services and data, delivering high availability and performance using elastic resources. EAPs will deliver faster performance and be more cost-effective to use. Organisations will efficiently manage high volumes of transaction and internal data and will also draw insight from the vast data resources that exist in public and industry domains.
- Social communication networks in the consumer world are forcing application suppliers to harness this technology within, or alongside, business applications. In the near term – the next one or two years – social collaboration will sit alongside enterprise applications, as only a few enterprise application suppliers will harness it successfully in the context of enabling business processes. Effective use of social collaboration in enterprise applications and business processes will take several years to mature, eventually becoming a relatively ubiquitous and standardised feature.
- Mobile technology is being leveraged to enhance timely transaction handling and data collection, as well as access robust tools for management decision making in supporting SCM, ERP and complimentary systems. Not only must internal application requirements address the mobility needs of its users, but interaction with external entities (e.g. suppliers) must be considered, as well.

Hammerman (2011) reports trends for next five years to shape the future of enterprise applications and ERP that will introduce new levels of process flexibility, improve the transparency of ownership costs, and accelerate the speed of process execution. As outlined in recent research from Forrester, seven technologies will drive this transformation: SaaS, mobile, BPM, usability by making these apps user-friendly and adding advanced analytics capabilities, PaaS, social networks, and elastic computing

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Research approach

Kothari (2004) defines research methodology as a way of finding a solution for research problems or it can be described as a science that deals with how research is carried out scientifically. Kothari (2004) points out that research methodology is important for researchers in order for them to do research in a way that highlights and gives essential training in collecting material and arranging and putting it together for carrying out research. Kothari (2004) also adds that there are two basic approaches to research: qualitative research and quantitative research. For this research qualitative research is applied. The definition and description of qualitative research is explained in detail as follows.

'Qualitative research is the collection, analysis and interpretation of data that cannot be meaningfully quantified, that is, summarized in the form of number' (Diggines & Wiid, 2009, p.85). Qualitative research basically depends on the gathering of qualitative data (Johnson & Christensen, 2012). Neergaard and Ulhoi (2007) define qualitative research as a research that focuses on a multi method approach that includes an interpretive and naturalistic view of its subject matter. Qualitative research is concerned with qualitative observable fact, or in other words a phenomenon that contains quality or kind (Kumar, 2008). Beije (2010) illustrates that, in qualitative research the research questions are carried out in a flexible manner allowing one to get in touch with the people concerned to a degree that is essential to grasp what is being carried out within the field. Beije (2010) also adds that the definition of qualitative research contains three key components:

3.2 Research Philosophy

(1) Looking for meaning
(2) Using flexible research methods enabling contact
(3) Providing qualitative findings

3.3 Research design

As already mentioned above, to carry out this research the authors decided that qualitative research is the best applicable method for the study. The reason of using qualitative research is due to the nature of the research that is based on gathering, and analyzing of qualitative data. In other words, the study is made by investigating and interpreting individual ideas and analyzing the findings in relation to the literature review in context to the research questions.

Since little research still exists with which to theories the important predictors for initial and ongoing ERP implementation success, **Exploratory Research** is used to learn and understand the problems faced by the management as well as the IT people while implementing an ERP package in their organization. Exploratory research helps in the formal study required in this area of research.

The exploratory research relies more heavily on **Qualitative Research Techniques** which deals with intangibles like attitude, opinions etc. The different research tools used are

- In-depth interviews (usually conversational rather than structured).
- Case studies (for an in-depth contextual analysis of a few events or conditions).
- Elite or expert interviewing (for information from influential or wellin formed people in an organization or community).
- Documentary analysis (to evaluate historical or contemporary confidential or public records, reports, government documents and opinions).

Along with the above research tools, appropriate tables, charts and matrices are used to analyze the research findings.

Sample Size and Sampling Method:

The sample size for the research project is 10 people are interviewed who are on top management of different companies, 10 IT consultants of different companies and 5 ERP vendors. The sampling method used is **Judgment Sampling** where the sample members are selected conform to some criterion, here the criterion being the members chosen have

experience on ERP implementation process.

Data Gathering Procedures and Instrumentation:

Data gathering procedures used for the research project are primary and secondary data collection methods.

Primary Data:

Primary data has been collected through the interaction with the top management and ERP consultants by interviews. The elite or expert interviewing is used for collecting the information from influential or well-informed people in an organization.

Secondary Data:

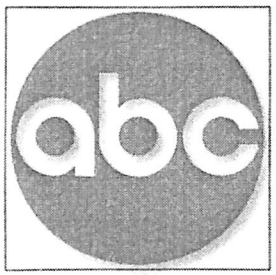
Secondary data is collected from journals, magazines, case studies, websites etc.

Data Analysis:

Data and information are collected from primary and secondary sources. Analysis is done on respondent's opinion & experience, Case studies, articles published in journals, magazines etc.

CHAPTER 4: DATA ANALYSIS, RESULTS AND DISCUSSION

4.1. About the Organization



ABC Corporation is a product development, engineering and consulting services company, serving technology startups as well as mid-size to large corporations. ABC offer a flexible blend of onsite, offsite and offshore services from our seven global delivery centers with over 1500 software professionals. ABC has deep client relationships spanning over 20 years with various clients ranging from startups to Fortune 100 companies.

ABC 's Product Development and Engineering service line offers a full life cycle software development and engineering services to independent software vendors, systems companies and companies offering enterprise, cloud, web, social networking, media and mobile applications. Our services span product development, testing, technical support, implementation and sustaining engineering.

Our Product Consulting service line offers package implementation solutions and services based on software products from TIBCO to customers in Financial Services, Hi-Tech, Telecommunications, Healthcare and Government segments.

ABC Onsite Services offers tactical solutions to our clients for their project execution in the short and long term.

Over 20 years, ABC has helped its clients deliver their products and services faster, with higher capabilities and quality, in a cost effective manner.

Company offers a flexible blend of onsite, offsite and offshore services from our seven global delivery centers with over 1500 software professionals. ABC has deep client relationships spanning over 20 years with various clients ranging from startups to Fortune 100 companies. We bring three core differentiators to every client engagement: the pedigree of having worked multiple technology stacks, the rigor of enterprise application development, and the flexibility of aligning to customer goals.

- Pedigree of Products
- Rigor of Engineering
- Flexibility

ABC brings a pedigree over two decades of experience in developing technology products and solutions through multiple technology generations. Over the years, we have worked with clients building, implementing, and keeping running products that span:

- Host-based systems of the 80's and early 90s
- Client server paradigm in the mid-90s
- Web architecture of late 90's and early 00's
- 3-tier architecture of this past decade and
- Mobile paradigm that is currently proliferating the market
- Future innovations coming down the pike

Not only have we built multiple enterprise and consumer products in each of these technology stacks, but we have also helped numerous clients with:

- Ensuring inter-operability of their products through the generations
- Maintaining their products through multiple generations
- Implementing these products in numerous customer environments and supporting the operations through various changes in technology and business components

Not only that, we are uniquely capable of understanding how our clients' customers require products and solutions to perform at their business from the functional standpoint, but also from the security, availability, and reliability standpoint.

ABC has been a partner of choice for our technology clients producing products touching one or more layers of the computing/communications ecosystem:

- Hardware / Firmware
- Systems, Storage, Networks
- Tools, Databases, Servers and
- Applications

Over the decades, we have worked on products utilizing multiple and changing paradigms in the core platform, storage, networking and the graphics stacks as well as tools, databases and servers in the computing/communications ecosystem. Our knowledge and expertise across these changing paradigms have helped our clients and their customers manage multi-vendor inter-operability through multiple generations of the technology layers.

ABC has participated in end-to-end software product engineering lifecycle beginning with product conception to ongoing software maintenance / sustaining, while at the same time, ABC teams have also assisted customers in specific tasks, as and when needed. ABC teams are fully conversant with the traditional SDLC (software development life cycle) approach, while many of our team members have developed expertise in the newer methods like Agile/Scrum, which are used by the web/social media oriented companies.

We offer the following Product engineering services:

- Product Ideation
- Product Architecture
- Testing & QA
- Migration and Porting
- Technical Support
- Sustaining Engineering

- Professional Services

Furthermore we bring expertise in the following practice areas:

- Cloud Infrastructure and Applications
- Enterprise and Consumer Mobility
- Enterprise/Web/Social Applications
- Networking and Storage Systems

Cloud Infrastructure and Applications: As cloud finds wider adoption, product companies find new paths of revenue by offering existing products as subscription, while new companies launch a slew of services.

We bring experience in:

- Design and development of virtualized systems
- Design and development of I/O sub-systems
- Enterprise to SaaS migration
- Cloud networking, storage, provisioning
- Monitoring, sizing cloud infrastructure

Some of our experience highlights include:

- Solution for on-demand cloud storage to traditional desktop applications—involving storage provisioning, resource usage tracking and billing.
- Cloud based supply chain management software for hotel and restaurant industry.
- Microsoft Outlook and Microsoft Office plug-ins for a cloud based storage company.
- Control console to manage authentication, administration, product licensing, inventory and usage data reporting for a desktop virtualizer.

4.2. ERP Implementation at ABC Corporation

The main reason of company's decision to implement ERP system is to increase efficiency and accuracy of their operations. In the first phase of the ERP implementation project was a short intensive study to set the scope of the project and provide an outline plan and costing. A steering committee was formed to administer the financial guidance of the project. An 'ERP Core Team' was also formed to control and oversee the actual implementation process. During the second phase, a detailed plan was created and a prototype system was installed. The ERP core team has to consider the various business processes within the scope of the project. Series of workshops tagged 'Business Simulation Workshops' were conducted comprising of 20 key personnel of the company. This was used to forge a strong relationship between the ERP core team and line personnel and avoid possible pitfalls, such as initiative fatigue or lack of co-operation. Activities carried out during the second phase of the project included:

- Preliminary design review- developing a design and implementation strategy, defining the scope of the project, and developing the business process model.
- High level design review- analyzes the enterprise model, and develop prototype.
- Critical design review- detailed design and customization of the prototype.
- Implementation realization- integration testing.
- Technical/operation review- user acceptance testing
- Post implementation reviews- system deployment, system conversion, user training before the 'Go Live'

Go-live defines the moment of completion of the ERP implement but the beginning of the post implementation where users' feedbacks are obtained to validate the system. When a new system is planned, the most difficult part of the implementation process is transferring of data from old systems. The shear volume of data that has to be transferred is far greater than any normal transaction load that will be carried out by the system thereafter. In order for this process to be successful the data must be kept in a 'stable' state for a period of roughly 10 weeks. The initial data to be transferred includes some transaction data and master data, for example, lists of suppliers and bill of materials. If any changes occur to the data on the old systems after the transfer, they are logged and then passed through to the new system. The remaining data was loaded in after the 'Go Live'

The next step during the 'Go Live' process involved running the MRP system to initialize the system. Purchase order and purchase requisitions was not transferred from the old system, instead the MRP run should create them fresh. The whole 'Go Live' process took roughly two weeks to complete, and during this time the new system was 'off the air'. Immediately after the 'Go Live' the existing system was switched to view only mode. The view only mode enabled comparisons to be performed between the old and new systems.

4.3. Challenges in ERP Implementation at ABC Corporation

From the interview, the major issues and challenges facing ERP implementation were identified. The respondents provided insight into the difficulties experienced during ERP implementation. These issues and challenges were categorized into six major themes namely reengineering (organization and infrastructures), top management commitment, funds, skilled manpower, implementation time and data fill-in

1. Process Reengineering

One of the major issues raised was on the need to reengineer the organization for the smooth fill-in of ERP. It was concluded that implementing an ERP system involves restructuring the existing business process to the best business process standard that will accommodate the ERP. One of the respondent said "one major benefit of ERP comes from reengineering the organization's existing way of doing business". Another respondent pointed out that "all the process in an organization must conform to the ERP model to ensure smooth running and productivity". Similarly, it was mentioned that "An organization has to change its processes to conform to the ERP package, customize the software to suit its needs". This is because ERP package has been found not to be able to suit some organization structure and the cost to customize the package to suit these organizations might be high. Likewise this view was supported that "the more the customization, the greater the implementation costs". It was further added that "to reduce the costs of customization and future maintenance and upgrade expanse we decided to reengineer our structure and process". Hence, the organization only has the alternative to reengineer and restructure her procedure and processes to suit the ERP in order to save cost on ERP customization

This finding collaborate argument that reengineering is the process of fixing the organizational procedure into the newly installed ERP to ensure efficiency and productivity. To achieve the desire competitive advantage, the organization must be willing to restructure her process and ways of doing business to accommodate the innovation provided by the ERP. These changes should be done within an overall Business Process Management Methodology in order to achieve desired competitive advantage. However, these studies only argued on reengineering as to business process and procedure while this paper argues that for reengineering to be robust and comprehensive there is need to consider both the organizational process and infrastructure together

2. Top Management Support

Similarly, respondents identified top management commitment as part of the issues and challenges facing successful ERP implementation. Implementing an ERP system is not a matter of changing software system, rather it is a matter of repositioning the organization and transforming the business practices. Due to enormous impact on the competitive advantage of the organization, management must be involved and cooperation in every step of the ERP implementation is highly important. This was pointed out by a respondent that "ERP implementation is about people...not system nor technology". During ERP implementation it could be seen that the organization goes through a major transformation, and the management of this change must be carefully planned (from a strategic viewpoint) and meticulously implemented. Many parts of the business that use to work in silos now have to be tightly integrated for ERP to work efficiently.

It was argued that "many ERP projects are abandoned due to the fact that many board members are of the view that IT engulfs lot of fund with little to compensate for it". This was supported by expressing that "lack of close monitoring and commitment to ERP projects by top management members are part of the factors for abandonment". Hence, the success of a major project like an ERP implementation completely hinges on the strong, sustainable commitment of top management. This commitment when percolates down through the organizational levels results in an overall organizational commitment. An overall organizational commitment that is very visible, well defined, and felt is a sure way to ensure a successful implementation.

This conclusion is consistent with argument that top management commitment is a factor that determines successful ERP implementation. However, these studies pointed out that top management commitment is less vital compare to other factors. This paper maintained that top management is key and vital as other factors in the implementation of ERP within the SMEs because the level of commitment and dedication given by top management goes a long way in determining the completion of the implementation. Their dispositions on the project have a huge effect in the abandonment or completion of the system

3. Funds

Collectively, both respondents identified fund as a major issue and challenge facing ERP implementation especially in its early phase. One of the respondent added that "ERP package is so complex and vast that it takes thousands of ringgits to roll out". This concern usually divides management where some are calling for the need to inject more fund into procurement of new technologies to gain competitive advantage over their competitors. Others usually argue that new technologies engulf lot of fund with little to compensate for it. A respondent reported that "IT department is the only part of the organization that don't bring revenue but engulf many funds for her operations". Therefore, when it comes to ERP implementation management determines extensive preparation to deflect wastefulness.

However, this finding contradicts argument that fund is purely as a function of top management commitment. They discussed fund under top management commitment factor and concluded that fund factor of ERP implementation depends on top management commitment. This concern was equally raised that "...how invested funds can quickly lead to additional business value and profitability is our greatest worries". Additionally, it was claim that "when the board members finally agreed with the plan of the I.T department on ERP implementation... we were worried on how to raise fund for the project". Consequently, it can be seen that there is difference between top management commitment and fund. This is because the top management might be willing to implement the project but cannot proceed in the absence of adequate funds. "Funds allocation to ERP implementation is the most critical decision to be taken by our organization executives" as argued by a respondent. Therefore, fund factor is a critical factor which should be separated from top management commitment.

4. Lack of Skilled Manpower

Furthermore, lack of skilled manpower was equally identified as a key issue and challenge to ERP implementation. Although, it was revealed that organization intending to implement ERP system should be willing to dedicate some of their best employees to the project for a successful implementation. It was suggested that "internal staffs should be allowed to head the implementation team...because they possess a good knowledge of the organizational structure and need". Internal staffs on the project will exhibit the ability to understand the overall needs of the organization and can play an important role in guiding the projects efforts in the right direction. However, insufficient knowledge of ERP implementation amongst the employee of the organization posts a major challenge to successful implementation.

Similarly, some ERP constants lack in-depth knowledge of ERP implementation which is needed to sufficiently support the organization. It was observed that consultants were unable to sufficiently train organization employee on the system. This factor hinders the smooth running of the IT department. Also, it was found that in the organization most of the older employee displayed lack of interest and willingness to learning the new skills which have huge negative impact on the operation of the organization. This was communicated that "there is lack of competent consultants with the ERP market while the competent ones are too expensive to engage by the SMEs". It was equally maintained that "finding the right manpower and keeping them through the implementation is a major challenge". Therefore, ERP implementation demands multiple skills–functional, technical, and interpersonal skills. Consequently, individuals with specific industry knowledge are fewer in multiple. Hence, getting the right manpower and consultants with all the required skills might be challenging.

Therefore, Training and updating employees on ERP is a major issue and challenge. People are one of the hidden costs of ERP implementation. ERP systems are extremely complex and demand rigorous training. It is difficult for consultants to pass on the knowledge to the employees in a short period of time. This "knowledge transfer" gets hard if the employees lack computer literacy or have computer phobia. In addition to being taught ERP technology, the employees now have to be taught their new responsibilities. With ERP systems one is continuously being trained. Hence, the need to provide constant training opportunities on a continuous basis to meet the changing needs of the business and employees is highly challenging for organization.

5. Implementation Time

In addition to skilled manpower, the issue of timing was identified critical in ERP implementation. This is because ERP systems come in modular fashion and cannot be implemented entirely at once. Organizations follow phase-in approach in which one module is implemented at a time. The problem with ERP package is that they are very general and need to be configured to a specific type of business. Thus, it was expressed that "ERP implementation consumes lots of time... takes lot of effort in preparation too". The customization section was identified the most critical because mentioned that "the customization took a longer time... but must be done carefully". It could be inferred that the more customization needed, the longer it will take to roll the software out and more it will cost to keep it up-to-date. Hence, implementation time is a critical factor in determining the success of ERP implementation.

6. Data Migration

Apart from reengineering, funds, top management commitment, skilled manpower and implementation time, another issue and challenge identified was data migration from old systems to new ERP database. Many of the respondents mentioned that "Go Live" was postponed because of data transfer activities. One respondent argued that "it not just about workable ERP...but comprehensive database that must meet the organization need". The safe and comprehensive transfer of data from old systems to the ERP is usually rigorous and delicates. It was similarly added that "The shear volume of data that has to be transferred is far greater than any normal transaction load that will be carried out by the system thereafter". Hence, in order for this process to be successful the data must be kept in a stable state and transfer in a safe manner.

The research was set to find out the level of agreement by respondents from different companies that had implemented the ERP were on those challenges. Table 4.2: Challenges faced when Implementing ERPs

CHAPTER 5: SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Introduction

Based on the findings, successful implementation of ERP is attributed to the three strategically stages namely, pre implementation, implementation, and post-implementation strategies. These recommendation and stage strategies can be summarized as.

5.2 Pre-Implementation (Planning) Recommendation

- Incorporate the risk and quality management plans in the change management plan
- Breakdown the project into natural phases or subsystem for modular planning and for development of cross functional communications.
- Consider a phase-based approach for gradual implementation rather than radical approach.
- Use appropriate planning styles for different tasks, detailed task plan for tangible tasks, iterative plans for evolving tasks, and personal communication plans for change management.
- Prepare plans for the recruitment, selection, and training of the necessary personnel for the project team

5.3. Implementation Recommendation

- Formulate a network for collecting user requirements and user feedback.
- Set-up monitoring and feedback network for collecting control information at each stage of the implementation process.
- Prepare to handle expected or unexpected crises and deviations from plans.
- Provide a strong leadership with concerns for the welfare of people and resource commitment.
- Provide a professionally stimulating work environment.
- Obtain top management support for the project and plan for an adequately resourced ad proficiently executed launch.

- Promote client consultation and user participation and obtain approval from parties for what is being undertaken throughout the project.
- Use pro-active communication to establish more realistic expectations about the technology capabilities while communicating in tailored way to each division or unit.
- Promote collaborative system development between users and developers.
- Use multi-functional project teams to bring complementary capabilities together during the total life of the project.
- Familiarize the staff about the incoming technology and train the people involve with the system.
- Use intra-project teams and intra- and inter industry networking for technology transfer.
- Provide stakeholders with a detailed plan of the implementation process, explain how it achieves business objectives, and keep them informed about the system and progress of its implementation.
- Propose possible ways for restructuring personnel and systems to accommodate the new technology including maximizing of system integration and interfacing

5.4.Post-implementation Recommendation

Post-implementation activities are critical for the acceptance (adoption) of ERP systems. Requirement of IT system and structures tend to change continuously even after the completion of a project. Post-project evaluation strategy could be followed in measuring the effectiveness of an ERP system, where questions such as listed below could be used for further improvement:

- whether the objectives of the ERP system were realized fully;
- whether the scheme option were considered adequately;
- whether the estimates and project information were accurate;
- whether or not the agreed practices and techniques were complied with;
- Any other factor which are considered appropriate.

Such evaluations could concentrate on, firstly, cost estimates against actual and reason for variations. Secondly, the evaluation could suggest any possible improvements to the IT system. Thirdly, the degree of staff consultation could be assessed and improvement suggested. Finally, post-implementation evaluation can suggest improved procedures in avoiding failure in similar projects in the organization.

5.4. Major Limitations of ERP Implementation

Many of the problems that companies face with ERP system are due to inadequate investment in training of all relevant personnel, including those implementing and testing changes, and setting corporate policies. There are limitations and pitfalls to ERP, for instance:

1. Success depends on the skill and experience of the work force, including education in how to make the system work correctly. Many companies attempt to cut implementation costs by cutting user training. Privately owned small enterprises are often sufferer, their ERP system is often operated by personnel with inadequate education in ERP in general.
2. Personnel turnover; companies can employ new managers lacking education in the company's ERP system.
3. Proposing changes in business practices that are out of synchronization with the best utilization of the company's selected ERP.
4. Total cost of ownership of ERP systems is very high.
5. ERP vendors can charge sums of money for annual license renewal that is unrelated to the size of the company using the ERP or its profitability.
6. Technical support personnel often give replies to callers that are inappropriate for the caller's corporate structure. Computer security concerns arise, for example when telling a non-programmer how to change a database on the fly, at a company that requires an audit trail of changes so as to meet some regulatory standards.
7. ERPs are often seen as too rigid, and difficult to adapt to the specific workflow and business process of some companies - this is cited as one of the main causes of their failure.
8. The system can suffer from the "weakest link" problem - an inefficiency in one department or at one of the partners may affect other participants.
9. Many of the integrated links need high accuracy in other applications to work effectively. A company can achieve minimum standards, then over time "dirty data" will reduce the reliability of some applications.
10. Once a system is established, switching costs are very high for any one of the partners (reducing flexibility and strategic control at the corporate level).
11. The blurring of company boundaries can cause problems in accountability, lines of responsibility, and employee morale.
12. Resistance in sharing sensitive internal information between departments can reduce the effectiveness of the software.

5.5. Conclusion and Recommendation for Further Studies

Technology is advancing at a very fast pace giving rise to growing commitment of globe for manufacturing excellence in pursuit of staying competitive. To achieve these business aspirations and goals, business processes are getting more interrelated and more complex, invariably causing new ERP implementations tougher and more challenging ever. This poses manifold threats and challenges to management intended to pursue ERP implementation in terms of selection of appropriate ERP tools and vendors to match available infrastructure and skill and expertise level of the organisation and also selection of appropriate implementation methodologies and models, to culminate in higher operational efficiencies and effectiveness of the organisation to help stay competitive. The ERP research area is diverse and very broad. The field of ERP will certainly continue to mature and even more in the emerging technologies. Many whitepapers on emerging technologies and ERP implementation have been identified which seems to be interesting to both the researchers, businesses and industrial organisations as they are potential areas for future research. Development of a ERP technology selection framework will also be attempted to balance the modern age corporate aspects like risk mitigation, integrating emerging technologies, aligning selection method with corporate's mission, vision, values through corporate strategies and finally, attempting a higher return on investment through ERP implementation.

ERP implementation brings lots of benefits and gains to the organization however, it equally have it pains and difficulties. This study had explored issues and challenges of ERP implementation faced by SMEs. Six issues and challenges were identified namely: reengineering (organization and infrastructures), top management commitment, funds, skilled manpower, data migration and implementation-time. This study made use of single-case study and data were gathered during an interview session where respondents were asked to recall past events. The study proposed a step-wise detailed strategies to achieve a successful implementation of ERP in SMEs. These strategies were grouped into three stages namely, pre-implementation, implementation, and post-implementation strategies. Hence, the study suggests that a better comprehension and adherence to these strategies will enhance successful ERP implementation in SMEs. Further research can make use of cross sectional and longitudinal methods where more

than one organization can be studied. Also data collection should be done at the exact period that the organizations are carrying out their ERP implementations.

References

- https://en.wikipedia.org/wiki/Enterprise_resource_planning
- https://en.wikipedia.org/wiki/ERP_system_selection_methodology
- https://en.wikipedia.org/wiki/SAP_ERP
- https://www.sap.com/india/products/enterprise-management-erp.html
- ERP: The Implementation Cycle (Computer Weekly Professional) - Stephen Harwood
- ERP: Making It Happen: The Implementers' Guide to Success with Enterprise Resource Planning - Thomas F. Wallace
- Directing the ERP Implementation: A Best Practice Guide to Avoiding Program Failure Traps While Tuning System Performance - Michael W. Pelphrey
- Al-Mashari, M., and Al-Mudimigh, A., (2003), "ERP Implementation: Lessons from a Case Study." Information Technology and People, Vol. 16, No. 1, pp 21-33.
- Aloini, D., Dulmin, R., and Mininno, V., (2007), "Risk Management in ERP Project Introduction: Review of the Literature." Information & Management, Vol. 44, No. 6, pp. 547-567
- Adams, B. and Martin, B. (2011) Organization Change Management Strategy, pp.1–10, Washington Community and Technical Colleges ERP Project.
- Addo-Tenkorang, R. and Helo, P.T. (2014) 'ERP SaaS value chain: a proposed SaaS model for manufacturing SCM networked activities', International Journal of Business Information Systems, Vol. 17, No. 3, pp.355–372.
- Al-Shamlan, H.M. and Al-Mudimigh, A.S. (2011) 'The change management strategies and processes for successful ERP implementation', International Journal of Computer Science Issues, Vol. 8, No. 2, pp.399–407.
- Asl, M.B., Khalilzadeh, A., Youshanlouei, H.R. and Mood, M.M. (2012) 'Identifying and ranking the effective factors on selecting enterprise resource planning system using the combined Delphi and Shannon Entropy approach', Elsevier Procedia – Social and Behavioral Sciences, Vol. 41, pp.513–520.
- Cebeci, U. (2009) 'Fuzzy AHP-based decision support system for selecting ERP systems in textile industry by using balanced scorecard', Elsevier Journal of Expert Systems with Applications, July, Vol. 36, No. 5, pp.8900–8909
- Hofton, P., Morican, K. and Heather, S. (2012) The Top Ten Change Management Challenges, Deloitt Publication

- Al-Shamlan, H.M. and Al-Mudimigh, A.S. (2011) 'The change management strategies and processes for successful ERP implementation', International Journal of Computer Science Issues, Vol. 8, No. 2, pp.399–407.
- Asl, M.B., Khalilzadeh, A., Youshanlouei, H.R. and Mood, M.M. (2012) 'Identifying and ranking the effective factors on selecting enterprise resource planning system using the combined Delphi and Shannon Entropy approach', Elsevier Procedia – Social and Behavioral Sciences, Vol. 41, pp.513–520.
- Cebeci, U. (2009) 'Fuzzy AHP-based decision support system for selecting ERP systems in textile industry by using balanced scorecard', Elsevier Journal of Expert Systems with Applications, July, Vol. 36, No. 5, pp.8900–8909
- Hofton, P., Morican, K. and Heather, S. (2012) The Top Ten Change Management Challenges, Deloitt Publication
- Al-Mashari, M., and Al-Mudimigh, A., (2003), "ERP Implementation: Lessons from a Case Study." Information Technology and People, Vol. 16, No. 1, pp 21-33.

APPENDIX I: QUESTIONNAIRE

Research Topic: Challenges of ERP Strategy Implementation by ABC Corporation.

Please take a few minutes to complete this questionnaire. Your answers will be completely anonymous, but your views, in combination with those of others are extremely important in understanding the challenges in the ERP implementation process and developing modalities to tackle them.

Part A: Organisation Profile

1. Name of the Organisation.....

2. Years of existance.....

3. Nature of the business.....

4. What is your organisation's total number of employees.....

5. Who owns your firm?

a. Private b. Public c. foreign entity d. State e. Collective entity

Part B: General Implementation Process

1) Kindly indicate the extent to which the following aspects influence your decision of ERP implementation on a scale of 1-5

1- No extent 2-Small extent **3- Moderate extent 4- Great Extent** **5- Very great extent**	1	2	3	4	5
To improve business performance					
Better integration of systems across multiple locations.					
Standardization of global business operations.					
Pressure to keep with competitors					

Gain strategic advantage						

2) Which year did the organisation implement ERP?.....

3) What approach did the organisation use

   a) The Big-Bang Approach (e.g. went live with all Modules & offices at One time)

   b) Phased approach by module

   Why did the organisation chose such an approach?

   .....

   .....

   .....

4) Was the implementation of your ERP system preceded by definition of an organisational vision by the senior management?

   a. Yes

   b. No

5) Which ERP system(s) is your organisation currently using? (Check all that apply)

   ( ) SAP

   ( ) J.D. Edwards

   ( ) Oracle

   ( ) PeopleSoft

   ( ) Baan

   ( ) Other, please specify:

   .....

   .....

6) i. What ERP modules/ fuctions are currently implemented in your organisation?(tick all that apply)

   ( ) All ERP functions

   ( ) Financial Accounting

   ( ) Management Accounting (controlling)

   ( ) Production Management

   ( ) Sales and Distribution

   ( ) Human Resource Management

( ) Payroll

( ) Industry Solutions

( ) Workflow

( ) Other, please specify: .....

.....

ii. If not all modules are implemented why is that so?

a) We are following a phased implementation and haven"t reached that module yet

b) We are seeking top management approval

c) We are seeking funding for implementation

d) Others

7) When did the first module go live?.....

8) Is the implementation plan still on course?

a) Yes

b) No

9) How would you describe your involvement in the ERP implementation

a) Executive sponsor

b) Project leader

c) Management team

d) Functional or technical leader

e) Partially involved

f) Not at all

10) Were you trained in the ERP system?

a) Yes

b) No

11) What is the training method used?

a) Specialised consulting firm

b) Internal resources

c) Not formal

12) What are your fears once the system is implemented

a) Job loss

b) Loss of position

c) Uncertainity

d) Others

13) To what extent do you agree or disagree with the below statements relating to the Business Process Re-engineering (BPR) in your organisation?

a) Business processes were extensively changed to align them with those offered by ERP system

b) The BPs were only not changed in cases where the processes had competitive advantage to the organisation

PART C: ERP IMPLEMENTATION CHALLENGES

1) How much do you agree or disagree with the following challenges in ERP implementation?

SA= Strongly Agree; A=Agree; N=Neutral; D=Disagree; SD=Strongly Disagree	**SA**	**A**	**N**	**D**	**SD**
Lack of skills for implementing and using ERP					
Insufficient training to users					
Integration of different types of data was a big problem					
Incompatibility with work					
High system cost					
Long customisation period					
Integration problems					
Benefits of the system not recognizable					
High user resistance					
Inadequate preparation by employees to the new system					
There was high staff turnover after implementation					
System led to major organisational changes					
ERP system too complex					
Security of the system easily compromised					
System led to many staff layoff					
Vendors" unreliability					

Quality of ERP not to standard					
~~Not enough time to implement the system~~					
There were many problems during file conversion					

2) Kindly comment on any other challenges experienced apart from the ones mentioned above.....

.....

.....

.....