Perspective of different stakeholders for a successful ERP Implementation

- A Comparative Study

Master Thesis in IT Management [EIK034]

Submitted by Team 2

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We also thank our families, without their mental and financial support it would have not been possible to complete this IT Management program.

Lastly, we would like to thank all our colleagues for their valuable comments during seminars.
ABSTRACT

Purpose: The primary purpose of this research is to compare and analyze the key factors from literature and practice for ERP implementation process and identify the most important factors according to the different stakeholder groups in an organization namely top management, middle management and end-users.

Design/Methodology/Approach: The methodological stance chosen for this research is Realistic. A combination of qualitative and quantitative research method has been used for data collection and data analysis of the research project. Both primary and secondary data collection methods were used; primary data was collected using questionnaires whereas secondary data was collected by doing an extensive critical literature review of journals, databases, websites and books. Content analysis method was used to analyze data.

Findings: Top twelve critical factors for ERP implementations have been shortlisted based on the frequency of their occurrence in different literature. From the literature review findings, an organization is divided into three stakeholder groups’ namely Top management, Middle management and End-users. The result of this thesis showed that there are significant differences in the perspectives of top management and middle management when compared with end-users. Comparative study also revealed that most of the findings of empirical data analysis are in consonance with the researcher’s viewpoint except few exceptions. It was also seen that the perceptions of stakeholders about the key factors change when stages are taken into consideration.

The most important factors according to the top management are Top Management Support and Commitment, Organizational Change Management, Project management and Project Champion. According to the middle management the most critical factors are Top Management Support and Commitment, Project Management, Effective Communication and Clear Goals and Objectives. On the other hand for end users the important factors are Education and Training, Clear Goals and Objectives, Data Accuracy, Effective Communication and Implementation Team. BPR is the least important and Clear Goals and Objectives is considered the most important by all three stakeholder groups.
**Useful Implications:** This thesis identifies whether any difference exists in perception of stakeholder groups in an organization. The key factors according to perception of each stakeholder group would be highlighted. ERP practitioners (ERP vendors, ERP consultant, organizations seeking ERP systems) would be benefited from this thesis because the perceptions of different stakeholders could be taken into consideration while designing the implementation strategy for ERP. By knowing that there exist some differences, these can be specifically targeted by the implementation team to reduce the gaps and help in fine-tuning of the ERP implementation process.

Since this thesis also involves the comparison of empirical findings with the existing literature, it would be of interest to academicians and researchers as well. The differences in literature and our finding would be an interesting topic for researchers to study why such gaps exist at the first place.

**Keywords:** Keywords such as ERP business success factors, ERP project success factors, IT/business manager’s perception, Stake holder’s perceptions about ERP, End user/Top manager/Middle manager satisfaction, Stake holders view point, Key users perception, ERP implementation: a comparison and ERP implementation process were used.
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**List of Abbreviations**

CEO: Chief Executive Officer

CIO: Chief Information Officer

ERP: Enterprise Resource Planning

IT: Information Technology

CSF: Critical Success Factors

BPR: Business Process Reengineering
1) INTRODUCTION
In the ever changing business environment companies face many challenges like increasing competition, rising customer expectations and shorter cycle for new product development. This increases the pressure on companies to provide more reliable delivery dates, communicate timely and accurate information, improve quality, and efficiently coordinate demand, supply and production. To accomplish these tasks organizations are turning more and more towards enterprise resource planning systems (Haft, et al., 2003). According to Haft, et al. (2003), the two major benefits of ERP systems are: a unified enterprise view of the business that encompass all major functions and departments, and an enterprise database where all major transactions are entered, stored, processed and monitored.

An Enterprise Resource Planning (ERP) system is amalgamated business software. It enables a company to manage its resources more effectively and efficiently by providing a total integrated solution for the organizations information processing needs (Kuang, et al., 2001). An ERP package has various functions like account payables, account receivables, order management, customer relationship management, procurement, manufacturing, planning process and human relationship management.

Much of the previous work has exhaustively reviewed the critical success factors for successful implementation of an ERP system. In other words, most of the research focused on ERP implementation process and its critical success factors. For example, Bradley (2008) has studied the importance of critical success factors in accordance with project success. Umble, et al. (2003) has elaborated on eleven prominent critical success factors and studied implementation steps and importance of these factors for a particular organization. Other authors have done comparative study of key factors involving different organizations which implemented ERP.

The area focusing on key factors from stakeholder’s perspective is relatively new and not many studies have been done on this topic. Finney and Corbett (2007) highlighted that thorough understanding of critical success factors from different stakeholder groups would help in better assessment of project planning phases. Additionally, it would help in determining whether the concerns of each and every group are handled effectively. The benefits from incorporating and addressing the key factors from different stakeholder’s perspective would enhance the
probability of attaining higher success levels and resulting in time-saving, cost-saving, quality and efficiency in the system (Finney and Corbett, 2007)

1.1) Problem Statement

As seen in the above sections, ERP systems bring about a whole new dimension to an Organization’s IT system by providing seamless integration of all the information flow across different departments (Davenport, 2000). ERP systems comprehensively address all the requirements of different functions of an organization. There are very high stakes involved in implementation process because of significant budgets and long implementation cycle. Subsequently, the risk and complexity involved in implementation of ERP makes it all together a different research area for academicians and researchers (Davenport, 2000; Stewart, G., 2001). For better results, a phased or structured approach for implementation process is cited by Robey, et al., (2002).

An ERP system impacts all the employees of an organizations starting from top management (e.g. Chief Information Officer, Chief Executive Officers) to managers (e.g. Business managers, IT managers) and end-users (people handling the transaction processes). An important issue often neglected is mentioned by Besson and Rowe (2001) that the methods used to convince the management for explaining the importance of ERP would be different than those that are required for end-users. This highlights the significance of studying the perception of different stakeholders about the factors important for ERP success. Clear understanding of these key factors from the perspective of different stakeholders would provide more insights to handle the concerns and requirements of each group. This would in turn improve success rate of an ERP implementation by taking into consideration each and every stakeholder group.

After presenting the problem statement, an accurate and useful strategic question should be framed. According to Fisher (2007, pp.34), strategic questions are often confused with research question. A clear strategic question should address the future roadmap of an organization and most importantly, it cannot be answered through research. However, information, judgment and experience are the key indicators that answer a strategic question.
Therefore, our proposed strategic question is: “How can an organization improve the ERP implementation process by taking into consideration the perceptions of different stakeholders about key factors?”

1.2) Research Question
What are the similarities and differences in perspectives of critical stakeholders in an organization about the key factors for an ERP implementation process?

1.3) Purpose
The primary purpose of this research is to compare and analyze the key factors from literature and practice for an ERP implementation process. To identify the most important factors according to the different stakeholder groups in an organization namely top management, middle management and end-users. Identifying these critical factors by understanding the perceptions of each of these groups can help the management and business professionals in having a successful ERP implementation in future. This thesis would also produce significant insights which will benefit ERP practitioners during ERP implementation process. It would help consultants, vendors, implementation teams and management to understand the importance of various factors at each stage and for different stakeholder groups. This would reduce the chances of unsuccessful and time-consuming implementation process. Even research community would also be enriched by this study and could use the findings of this research to analyze the reasons for differences in perceptions of stakeholders.

1.4) Choice of Topic
According to Fisher (2007, p.31), master thesis topic should be selected as per the interest of the researchers and due to long time duration of master thesis the lack of interest and motivation should not creep in during the research process. Additionally, Fisher (2007, p.31) stresses on the fact that topic should be of interest to other readers as well and not only for thesis authors. We feel this topic is not only of great interest to us but also to the various ERP practitioners, professors and students interested in enterprise resource planning implementation.

Different stakeholder groups have different perspectives about factors important for ERP implementation, each group has its own interests and different amounts of power. These
differences exists because each stakeholder group requires different benefits from ERP, differs in their understanding about the success of ERP and each group views the impact of ERP on their tasks differently. It would be interesting to study the different perspectives of stakeholders involved and comparing the findings with the existing literature.

Before selecting a topic for master thesis, one check is extremely important that deals with the availability of enough literature to perform a literature review (Fisher, 2007). Research has been done by different researchers on topics similar to our topic and around thirty five papers are selected from various databases and journals that would be required for critical literature review.

Fisher (2007) has also insisted to make sure that there are enough people to help in answering the research question. We are able to get in touch with many ERP users who are ready to answer our questions regarding our research, which proved to be a big motivation in choosing this topic.

1.5) Scope of Research

As Fisher (2007, p.35) has mentioned that for a better thesis, comparative element should be present in the study. As comparison between different phenomena creates contrast and makes it easier to view things clearly. This thesis involves investigating the most important factors for ERP implementation according to the perspective of different stakeholders. This research has been accomplished by circulating a questionnaire to different levels of employees such as CEO, CFO, project manager, IT manager and end-users of multiple organizations where ERP is implemented. The data collated from various literatures would help in comparative study of the different perspectives. Empirical results have been compared with research literature to identify whether any difference exist in perspectives mentioned in literature and empirical data findings.

- Only the stakeholders inside the organizations are in scope of this thesis
- Outside stakeholders like suppliers, customers etc. are out of the scope of research.
- Only organizations where ERP systems are implemented would be considered for research.
- Organizations from different sectors such as manufacturing, retail, telecom etc. would be in scope of this research. The focus is not on a specific sector.
1.6) Target Groups
This thesis would be identifying whether any difference exists in perception of stakeholder groups in an organization. The key factors according to perception of each stakeholder group would be highlighted. ERP practitioners (ERP vendors, ERP consultant, organizations seeking ERP systems) would be benefited from this thesis because the perceptions of different stakeholders could be taken into consideration while designing the implementation strategy for ERP. By knowing that there exist some differences, these can be specifically targeted by the implementation team to reduce the gaps and help in fine-tuning of the ERP implementation process.

Since this thesis also involves the comparison of empirical findings with the existing literature, it would be of interest to academicians and researchers as well. The differences in literature and our finding would be an interesting topic for researchers to study why such gaps exist at the first place.

1.7) Thesis Design
The structure of our thesis would primarily constitute of the following chapters:

**Introduction:** It would include what is ERP, why do organizations need ERP, the evolution of ERP, problem statement, why we chose this topic, objective and purpose of the paper, scope of the research, research question and strategic question.

**Research Methodology:** This would include the detailed methodology that would be used in performing this research. The data collection methods, data analysis methods and type of articles used would be described in this section.

**Conceptual framework:** This section will contain a conceptual framework model and the main concepts as defined in different literatures and selection of concept definitions which would be used for the rest of the thesis.
**Research Data:** This section would provide the details of the data that has been collected from the different ERP practitioners. The data will be provided depending upon the number of responses and key factors according to different stakeholders in the form of tables.

**Analysis:** In this section the data collected from different practitioners would be analyzed using data collation, bar graphs to identify the most critical factors for each stakeholder.

**Conclusion:** This section would constitute of the final results and the answer to our research question as per the analysis conducted based on the data collected.

**Recommendations for future research:** In this section we would give suggestions about which are the different areas in which this research can be further continued and used. The suggestions and recommendations would be based upon the research performed in the thesis.

### 2) RESEARCH METHODOLOGY

Many a times, the terms ‘method’ and ‘methodology’ are used interchangeably. But Fisher (2007, p.40) has clearly distinguished between these terms. Questionnaires, interviews, focus groups are different types of methods used in research and should not be confused with the term ‘methodology’ (Fisher, 2007 p.40). Methodology, according to Fisher (2007, p.40), is the study of methods and involves selection of appropriate approach to conduct a research project, given the research problem and the circumstances at hand.

#### 2.1) Methodology Layout

The below figure shows an outline of the methodology that we are going to use in our research.
Illustration 1: Methodology Outline – Flow of Thesis Process (Source- own understanding)
2.2) Methodological Stance – Realistic

Various methodological stances including ivory tower, realistic, interpretive ethnographic research and action research are mentioned by Fisher (2007, pp.41). Knowledge generated and action recommended are the two key factors that distinguish different stances. Fisher (2007, pp.41) mentions that each research focuses on either knowledge generated from the research or actions recommended based on the research; or both of them.

This research is conducted on the realistic methodological stance. According to Fisher (2007, pp.42), “the knowledge gained through realistic approach can accurately mirror the reality itself”. Fisher (2007, pp.42) also pointed out that realist researcher believes that “the knowledge acquired can give good indication of what should be done”. The essence of realistic research is usage of acquired knowledge to evaluate the options for practical purpose. Thus, the purpose of this research to examine the important factors according to the perceptions of the different stakeholders, which would help ERP practitioners target the different stakeholders as per their perceptions and improve the overall success rate of ERP implementation.

2.3) Approach – Structured & Deductive

For the purpose of conducting a research, an approach should be decided which would guide the research process. For our thesis, we have examined two types of approaches for conducting research namely structured approach and grounded theory. According to Fisher (2007, pp.123), in structured approach a structure is imposed on the research that is based on preliminary theory, concept and hypothesis. This structure guides the researcher for the collection process of the material. On the other hand, grounded approach involves collection of material for research without any preliminary concepts and theories in mind. Fisher (2007, pp.123) mentions that in this approach, the theory emerges from the collected material rather than being forced out of it by the use of a predetermined idea or theory.

We have followed the structured approach for performing the literature review of our research. It would involve searching the articles involving the concepts and theories which we would be using in our thesis. After analyzing the articles, appropriate material would be short listed for conducting literature review. This would help us in designing the conceptual framework which would guide the structure of our research.
We have also examined other approaches for conducting the research namely deductive or inductive approach. Deductive approach means that specific conclusions and data collection process can be guided by general concepts and theories (Fisher, 2007 pp.321). In this approach, conclusions are made based on logic and not on experimentation or experience (Fisher, 2007 pp.321). The inductive approach means drawing general conclusions from specific and detailed findings. Through this approach, theory can be revised once the data is collected and analyzed. After considering our research topic we decided to stick to the deductive approach since extensive literature review of specific concepts and theories guided the data collection process. The twelve critical factors that were decided to be put in the questionnaire were also decided based only on the literature review.

2.4) Research Method – Combination of Qualitative & Quantitative

Qualitative and quantitative methods are the two types of research methods through which data collection and data analysis of a research project can be accomplished. Fisher (2007, pp.62) has highlighted one commonly-made but wrong assumption that “realist research means using quantitative methods and interpretive research uses qualitative methods and material.” Any research method can be used to produce either quantitative or qualitative material. As our research involves theoretical framework as well as empirical data, we would be using a combination of these two methods. The pre-coded questionnaire survey would provide data for quantitative analysis and content analysis of theoretical background would be based on qualitative methods. Additionally, content analysis would also be adding an element of quantitative analysis to our research.

Fisher (2007, pp.158) has categorized research method as open or unstructured and close or structured. In open ended research, the answers provided to the research questions are not anticipated and researcher allows the open responses of respondents to the questions (Fisher, 2007 pp.158). In structured research method, researcher already has fair idea of the “likely range of answers” (Fisher, 2007 pp.158). For the purpose of this research, pre-coded questionnaire method and content analysis are employed.

In pre-coded questionnaire respondents are provided with previously prepared questions and need to select the options based on their perceptions. Since, we are interested in the gathering the
data for perceptions based on the frequency of the option selected; this method is selected for the research. As Fisher (2007, pp.184) states that content analysis adds quantitative element to the analysis of qualitative material, for reviewing the literature this is the most appropriate research method in our case. This method helps in measuring the frequency with which issues or concepts appear in the literature. For the purpose of our research, through content analysis we would be selecting the important key factors according to articles selected.

### 2.5) Data Collection

For the purpose of this research, primary as well as secondary data is collected.

#### 2.5.1) Primary Data

The *primary data* for research was collected using a questionnaire designed with the help of our supervisor. It was then be reviewed by fellow students as well as some IT professionals and then sent across to ERP practitioners to collect various responses. Peer reviewing the questionnaire would help us know if the questions are clear and easily understandable. According to Fisher, 2007 there are two types of questionnaires pre-coded and open questionnaires, as mentioned above a pre coded questionnaire would be used for this research. The questionnaire would be sent across to the practitioners primarily using e-mail. Only multiple choice, rating scale and one word answer questions have been used in the questionnaire for the convenience of the respondents.

*Multiple choice questions* are those in which the respondent has to select from the provided options (Fisher, 2007 pg 194). Since we have twelve factors in our study and wish to select three most important ones, in part B of the questionnaire we provide the twelve factors as options and ask the respondent to select the top three.

*Rating Scale questions* are those in which the respondent has to rate or evaluate the option based on a carefully graduated scale (Fisher, 2007 pg 194). In part A of the questionnaire we provide a question for each factor. Here we ask the respondent to rate the importance of each factor for a successful ERP implementation on a scale of one to five with five being the most critical for success.
2.5.2) Secondary Data

The secondary data would be collected by using various online databases like ProQuest, Sciencedirect, Emerald, Diva and ACM Digital Library. The access to these databases is through the MDH (Mälardalen University) digital library. Our topic of research focuses on ERP success factors but since it is a very broad topic we narrow it down using the different perspectives of various stakeholders. We also try to narrow it down by using the different phases in an ERP implementation and dividing the factors across different phases. The specific keywords that were used for collecting data during this research will be discussed in the next section.

<table>
<thead>
<tr>
<th>No. of articles selected</th>
<th>No. of articles used</th>
<th>No. of very related articles</th>
</tr>
</thead>
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<tr>
<td>66</td>
<td>55</td>
<td>39</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Most Used Journal</th>
<th>Most Used Data bases</th>
<th>Publishing date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business process</td>
<td>ProQuest</td>
<td>2000 to 2010 (one article</td>
</tr>
<tr>
<td>management</td>
<td>Emerald</td>
<td>published 1989)</td>
</tr>
<tr>
<td></td>
<td>Science Direct</td>
<td></td>
</tr>
</tbody>
</table>

Illustration 2: Overview of the articles used

Keywords

ERP business success factors, ERP project success factors, IT/business managers perception, Stakeholder’s perceptions about ERP, End user/Top manager/Middle manager satisfaction, Stakeholders viewpoint, Key users perception, ERP implementation: Chief executive officers' perceptions, ERP implementation: a comparison, ERP implementation process.

The combination of “ERP implementation success” and “stakeholders’ perception” are the main focus of our work. ERP implementation success is a broad topic and stakeholders’ concern on ERP implementation success is also a wide-ranging topic thus we decided to narrow down our
research and get more precise articles. Adding Top managers, middle manager and end users’ perception to the key words “ERP implementation success” gave us more specific articles.

**Databases/Websites**

Here is the list of databases as well as websites that we used in our research.

<table>
<thead>
<tr>
<th>Database / Website</th>
<th>Topic</th>
<th>URL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emerald</td>
<td>Journals / Articles</td>
<td><a href="http://www.emeraldinsight.com/">http://www.emeraldinsight.com/</a></td>
</tr>
<tr>
<td>Bookit</td>
<td>Books in the local library</td>
<td>University Library Catalogue</td>
</tr>
<tr>
<td>ScienceDirect</td>
<td>Journals, e-books</td>
<td><a href="http://sciencedirect.com">http://sciencedirect.com</a></td>
</tr>
<tr>
<td>EBSCO</td>
<td>Journals</td>
<td><a href="http://search.ebscohost.com">http://search.ebscohost.com</a></td>
</tr>
<tr>
<td>Google Scholar</td>
<td>Scientific articles &amp; books</td>
<td><a href="http://www.scholar.google.com">www.scholar.google.com</a></td>
</tr>
<tr>
<td>ABI/INFORM Global (ProQuest)</td>
<td>Business topics</td>
<td><a href="http://ep.bib.mdh.se:2059/pqdweb">http://ep.bib.mdh.se:2059/pqdweb</a></td>
</tr>
<tr>
<td>ACM Digital Library</td>
<td>Journals / Articles</td>
<td><a href="http://ep.bib.mdh.se:2151/dl.cfm">http://ep.bib.mdh.se:2151/dl.cfm</a></td>
</tr>
</tbody>
</table>

**Illustration 3: Databases**

Our past experience in searching for business and IT articles show that the most useful databases are ABI/INFORM Global, Emerald, Science Direct and Google scholar. But we also search through Bookit, EBSCO and ACM Digital Library. We have found 15 exactly related and 30 related articles through the above mentioned databases. Majority of our articles found form ProQuest (20 articles), Emerald (15 articles) and Science direct (10 articles).

**Literature Map**

As Fisher (2007) states describing and mapping the literature relevant to your research project is a step by-step process that moves from the general to the specific (Fisher, 2007, p. 86), thus, we first illustrate a map that shows the related literature to our topic. Below illustration represents a map that shows the literature useful for comprehending our research topic.
A pivotal issue in examining successful deployment of ERP systems lies behind Critical Success Factors. Significant amount of prior research has been done on this area but not many articles investigate the different stakeholders’ perception of success factors. Earlier we were keen on understanding the perception of every stakeholder on each phase of implementation but as we could not find sufficient literature on this area we focused on identifying the factors that generate overall system success in the view of Top manager, Middle manager and End-user. (Red circle in the figure 1).

As you can see in the above map one of the literatures is Organizational Culture, this area was added because during our researches we found that different cultures in organizations might affect the stakeholders’ perception of CSFs.

2.5.3) Sample of Companies
Since our research is not concentrating on any specific sector of the industry we got data from three sectors, namely Manufacturing, IT and Telecom. Getting data from different sectors would help us to know a generic view about the key factors in the corporate world and the results of this research would then be helpful to majority of the ERP practitioners. Since IT companies do not use all modules of ERP extensively we sent the questionnaire to only those people who are working on any one specific ERP module. We sent the questionnaire to 9 organizations in all (mostly in India) and in each organization we tried to get data from each segment of the
stakeholder groups in our research. All the organizations we chose are using the latest ERP packages. The organizations from which we got successful responses are Eaton, T Systems, Punj Lloyd Engineering Ltd., Infosys, Accenture, Bechtel and Coca Cola.

2.6) Data Analysis

The next step after finding relevant articles for our research is to conduct a detailed literature review. We try to list down the most important arguments from all articles which are related to our research and try to compare the different views of the various authors about the selected arguments.

Next we would make a table to list down the number of occurrences of each factor in different articles. Based on this we pick the most relevant and frequently occurring factors for our research. These factors would be used to design the questionnaire which is required to collect the primary data from different organizations.

Once we receive all the responses we would start analyzing the data by observing which factors are most important for each stakeholder group. Also for each stage which are the most important factors according to different stakeholder groups. The ERP lifecycle model given by Madsen and Ehie (2005) has been selected to categorize the factors into different stages. The analysis would be performed by taking averages of the ratings given by different stakeholders, the factors with the highest average would be considered most important. We would also be drawing various charts including tables and bar graphs representing various trends and patterns of the different perceptions. After getting the results, we would compare these results with the existing literature to see if the views of ERP practitioners differ from the various researchers.

2.7) Method Critique

According to Fisher (2007, p.124) the major drawback of using structured approach is that researchers would be reluctant to make any amendments in the initial framework even when findings absolutely require modifications.

However, this drawback could be used in our favor if we could come up with grounded critiques contradicting the established theories. Few of the articles that made significant contribution to our research topic could not be accessed due to payment required for various books and articles.
Questionnaire survey is an important research method for data collection but limited resources and contact details would hamper the quantity of the data collected.

**2.8) Validity and Reliability of the Research**

To ensure the validity of this research we have used mostly scientific articles from peer reviewed journals. We tried to avoid conference papers and papers from the internet which could have low reliability. Additionally, all databases used to find articles are from Malardalen university library and hence can be considered reliable. Most of the factors chosen to collect empirical data have been repeated in at least ten research papers, the high frequency of occurrence of these factors in different articles ensures that all these factors are critical for successful ERP implementation. The questionnaire created is peer reviewed by fellow students and IT professionals to ensure the validity and reliability of the questions. This questionnaire is circulated to only ERP practitioners who are currently using the latest ERP packages so that we get access to only the latest experience and information available in the industry.

**2.9) Difficulties- Problems faced**

This section covers what all problems we faced during data collection, both primary and secondary. At first our research focused on key factors at different stages of an ERP implementation process so we found various implementation lifecycles by different researchers. It was difficult to decide on which lifecycle to decide for our research, but finally we decided to go with the implementation phases by Madsen and Ehie (2005). But later after discussion with our supervisor our research topic was a bit modified to the different perspectives of stakeholders about the key factors for successful implementation. So we had to find some more literature which focuses on different perspectives of the stakeholders. Not much research had been done on this topic so it was a bit difficult to find very specific literature related to our topic. We used a lot of keywords to search for literature in different databases but some of them were too broad so we had to narrow them down to get more specific results.

While collecting primary data some of the problems we faced were like, most of the companies we contacted were in India so the only point of contact was through e-mail. So after sending out the questionnaire we had to send reminders repeatedly since we were not getting the responses. Due to this our responses got delayed and number of responses got reduced. Another major
obstacle was that we needed to collect data from top management which included CEO, CFO, Unit heads etc. Since most of the companies we contacted are huge organizations some of them having employee strength of around 100,000 it was extremely difficult to get the response of the people at the top of the hierarchy. Another obstacle we faced was that some of the responses we received looked fake as the same option had been marked for all options and in some cases few options were left blank. In such a case we had to discard that response which further led to reduction of responses.

3) **CONCEPTUAL FRAMEWORK**

In this section we will have well-structured discussion of the concepts used: ERP implementation process, critical success factors, five stage implementation lifecycle and perceptions of different stakeholders in accordance with the existing literature available on these topics. For clear representation, conceptual framework is developed to give description of relationship between the identified concepts.

According to Fisher (2007, p.123), “One of the big practical questions is when in the research process you should define concepts and draft a conceptual framework.” As mentioned in the methodology section, the definition of concepts and conceptual framework would be based on Structured Approach, the concepts and conceptual framework designing is handled in the beginning of the research process. The developed structure would guide the research and material collection process for this thesis.
3.1) ERP Implementation

Before developing conceptual framework, according to Fisher (2007, p. 126) “… explain to the reader the range of definitions that are available in the literature and then choose one that seems to you the best suited for your research project.”

According to Yahaya, et al. (2004) Enterprise Resource Planning (ERP) helps in the corporate management of an organization and focuses on integration of different functional departments including finance, human resource, procurement and distribution etc. ERP is an integrated software solution enabling organizations to gain a holistic view of the entire enterprise. ERP system simplifies the processes by maintaining one database, one applications and a unified interface across the value chain (Madsen and Ehie, 2005; Bingi, et al. 1999).

Even after clear understanding of the ERP systems, most of the organizations however, do not realize the full potential of ERP systems implemented. Many companies that try to implement ERP systems face difficulties in the process as they are not ready for integration and different...
functional units of the organization have their own set of agendas and objectives (Langenwalter, 2000).

As seen above, the role of implementation of ERP system is undoubtedly critical for the future competitive strategy of an organization as cited by Madsen and Ehie (2005). Management must accept the strategic role of ERP systems as the backbone. However, for bringing out the best from ERP systems, organizations need to pay attention to the complexities of the implementation process involved and the key factors impacting each stage.

Unfortunately, many organizations have a preconceived notion that choice of ERP software equates successful ERP implementation. ERP software should not drive the business decision making process. Therefore, ERP implementation cycle should be designed keeping in view its strategic alignment with the organization’s expectations from ERP systems.

Numerous definitions of ERP implementation have been cited in the literature, a good example can be the definition of Aldawani (2001) who mentioned ERP system is an integrated set of procedures that covers all the organizational core activities. But referring to a more comprehensive definition we can mention Al-mashari et al., (2003) research which alluded that ERP implementation combines both business processes and IT concepts in one integrated solution. Ehie and Madsen (2004) also upon touch the same point that ERP systems provide programs that integrate their business functions into a unified and integrated business process.

According to Al-mashari et al., (2002) ERP implementation facilitates the integration between data processes, management decisions and analysis functionalities. This is one of the pivotal reasons that make ERP implementation one of the largest IT investments in the current decade.

Technical capabilities of ERP systems are relatively important to ERP success but the successful implementation will not be evaluated based only on technical merits. As suggested by Chen (2001) there are more important issues before the ERP adoption which should be taken into consideration. Furthermore, organizations cannot confirm system success immediately upon the implementation. Al-Mashari et al., (2002) mentioned in their research that the real business value of ERP systems may not be realized quickly even if an organization confirms the
successful implementation. Success evaluation will start upon the post-implementation procedure (Lin and Rohm, 2009).

Researchers usually do not distinguish between ERP system success and ERP implementation success but Ifinedo and Nahar (2006) argue that ERP system success and ERP implementation success are two different issues. ERP implementation success refers to the process that enhances the organizational goals, project management metrics and a time estimate plan. ERP system success encompasses various dimensions therefore it is important to have a framework or model when measuring such systems. With regard to ERP system success Ifinedo and Nahar (2006) provide a model that is composed of six main dimensions: System Quality, Information Quality, Vendor quality, Individual Impact, Workgroup impact and Organizational impact.

Although ERP systems generate major benefits for enterprises, many businesses are discovering that the ERP implementation includes many serious challenges. The greater the changes made to an ERP system, the more changes occur in the existing processes and thus generate more risks for the organization (Dong., 2001). Numerous examples of unsuccessful implementation projects have been mentioned in the past literatures for example, Akbulut and Motwani (2005) mentioned that more than 90% of ERP implementations have faced challenges during the implementation process and more than 70% ERP implementation failed to meet the satisfaction of the expected benefit. This failure even includes top-notch companies such a Boeing, Mobil Europe. (Chen 2001).

The high failure rate of ERP implementations urges researchers to identify the factors that are critical to successful implementation of ERP systems. In short, many researches apply Critical Success Factors approach to identify those conditions that should be met in order for the implementation procedure to occur successfully. However, there is some criticism of CSF approach because it is felt that it grasps only senior managers’ ideas (Finney and Corbett, 2007). To avoid this problem in this research we investigate the criticality of key factors for an ERP implementation from the perspective of three stakeholder groups namely, senior management, middle management and end-users.
3.2) Key Factors for ERP Implementation

After studying the ERP implementation phases, the next concept for this thesis is key factors for implementation process. In the past few decades, the focus area of key factors for ERP implementation has been researched extensively and various research papers are also published by distinguished authors. This section will deal with the different definitions of key factors as per different authors and overview of factors for ERP implementation process which are highlighted in various research papers.

Plant, et al. (2007) have defined the key factors as the factors which impact the outcome of ERP implementation at the distinct stages of the process. The key factors utilized for their research are chosen from another researcher work by Somers and Nelson (2001). Somers and Nelson (2001) have identified twenty two factors and have given relative ranking to each of the key factors on the basis of their importance in ERP implementation process. Plant, et al. (2007) have used these factors for their research and assessed the importance of these factors for pre-implementation and post-implementation.

Nah, et al. (2001) defines “key factors as important predictors for initial and ongoing ERP implementation success.” In this paper, eleven key factors are identified that are critical for successful implementation of ERP systems. These key factors are later classified for Marcus and Tanis (2000) process oriented ERP life cycle model.

One broad definition of key factors according to Reel (1999) is that key factors impact the development effort involved in a software project. This impact is independent of design and development methodology, the implementation language or the application domain. One of the interesting statement quoted in an old article by Rockart (1979) which holds good till date is that “success factors can be temporal i.e. their relative importance changes with the stages of the project life cycle”. This statement holds extreme importance as this thesis also identifies the key factors at each and every stage of implementation project.

Umble, et al. (2003) defines the key factors as the key indicators that determine whether the implementation would be successful or not. Total eleven factors are identified namely; clear understanding of strategic goals, commitment by top management, excellent project
management, organization change management, a great implementation team, data accuracy, extensive education and training, focused performance measures, multi-site issues.

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Factor Name</th>
<th>Author’s name /Article published date</th>
<th>Frequency</th>
</tr>
</thead>
</table>
Illustration 6: Frequency of key factors in different articles

**Top Management Support**

A review of successful ERP implementations has shown that strong leadership, commitment, and participation of top management are the most critical factors in organizations using ERP systems. The support and encouragement of top management in not only required for setting the
business vision and leading the business, it is also for providing creativity and energy to employees (Al-Mashari et al., 2002). Ehie and Madsen (2005) in their research note that top management has the strongest correlation to successful ERP implementation among other identified factors. Kumar and Masheswari (2002) in their research paper found top management executives as the key people in the implementation team. They also found senior management was involved in about 50% of the implementation projects. Plant and Willcocks (2005) study examines the CSFs in two case studies. Findings in both case studies show that top management support is ingrained in the implementation process.

As suggested by Somer and Nelson (2001) not receiving enough support from the senior executives might lead to project cancelation, they also found that project cancelation happens when top management delegate monitoring and decision making on critical issues to technical experts.

**Organizational Change Management**

Managing change is priority for many organizations embarking ERP systems and is the other widely cited Critical Success Factor. ERP implementation causes large-scale changes in organizations that might cause confusion, resistance, redundancies, and errors (Sumner and Nelson, 2001). In these situations employees prefer using the legacy system. Prompt responsiveness to internal customers is essential for each and every organization to prevent problems associated with change (Al-Mashari et al., 2002).

To assist organizations with employee’s resistance Alawani (2001) suggested a conceptual frame work consisting of three phases of knowledge formulation, strategy implementation and evaluation. In the first phase he determines the source of employees’ resistance and in the next phase he explicitly describes that ERP system should not be introduced until a positive attitude is built among the users. It is the responsibility of the top managers to build this positive attitude. The process of assessment and evaluation of change management strategies is discussed in the last phase.

Kumar et al., (2003) in their case study asked about change management initiatives for implementing ERP systems. Findings show that some changes occur in organizations while
implementing the new system. For example, a new supply change group was added and in other units some new positions were created. Thus in their survey about 50% of the respondents reported change is required in organization structure to support the new system. However, Kumar et al., (2003) found out that the old procedure might remain despite being supported by new system because of the employee’s untruthful perception of data on new system. One of the suggestions by the author for this problem was to run the legacy system in parallel with the new system till assurance was achieved with new ERP system.

**Project Management**

Project management plays a pivotal role for ERP implementation process and requires a top-notch management team that takes into consideration the timelines of the project. Nah et al., (2001) noted that project management involves not only the planning stages but also allocation of the job responsibility of various team players, training the employees and determining the project success. Somer and Nelson (2001) also touch the same point that project management requires a steering committee consisting of senior management from IT and business functions. Finney and Corbett (2007) also argue that one of the responsibilities of this steering committee should be project management.

Yusuf et al., (2004) findings on Rolls-Royce case study show that the ERP projects consist of management team from external organizations as well as top-notch people from SAP consultants. Further, Yanhong (2009) noted in his research that 75% of the respondent’s recommended that lack of project management is one the most important factor leading to failure of the project.

**Education and Training**

According to Gupta (2000) one problem that is common to all implementations is poor end-user training. The ERP system is deployed but no one in the organization knows how to work with the system and even the staff doesn’t know how to maintain the system. Therefore education and training is one the most widely recognized Critical Success factors. If the users do not understand how the ERP system works they will try to use their own methods for the part of the system they are able to manipulate (Umble et al., 2002). Consequently, as suggested by Somer
and Nelson (2001) those who use ERP should be trained on their job scope on how to use the system.

According to the literature, lack of training will lead to ERP implementation failure (Somer and Nelson 2001). According to Gupta (2000) managers must take into consideration different options for end-user training. This training either can be in-house labs or hiring consultants from outside the organization. It is noticeable that end-user training is not important for all the stakeholders in an organization. As noted by Kamhawi and Gunasekaran (2009) training is more important for IS managers compared to non-IS managers.

Yusuf et al., (2004) findings on Rolls-Royce case study show that training plays a crucial role during ERP implementation. He noted that training took the form of organized seminars as well as presentations within the work place. The training comprised of two categories: Specialist training and Normal training. The specialist training was technical based and was carried out by SAP consultants. The normal training was for end-users and was conducted internally in collaboration with EDS consultants. In Rolls-Royce more than 10,000 people have been trained.

**Implementation Team**

It has been repeatedly mentioned by various researches that success of any project depends on its members, thus a strong implementation team is required that comprises of the organizations brightest people. As noted by Umble and Haft (2003) the implementation team is important because it is responsible for creating detailed project plan, assigning responsibilities for various activities and identifying the due dates.

Somer and Nelson (2001) in a survey from IT executives found project team competence ranked second among other identified Critical Successful Factors. Plant and Willcocks (2007) also name project team competence as the second most important Critical Success Factors. Recent research (Bradley, 2008) has proposed based on the previous literatures that formal or informal reward to project team is positively associated with ERP implementation success.

Regarding the importance of the implementation team Nah et al., (2003) in a survey from CIO understand that having a cross-functional knowledgeable team is necessary for the implementation process. Gupta (2000) also mentioned that project team deal with broad scope of
issues and problems ranging from personal computer issue to management challenges. A team constitutes of different people in different organizations but the survey by Kumar et al., (2003) show that Management, IT consultants and ERP vendors were the key team members of the project team.

Al-mashari (2003) found that one of the ways to increase the alignment of IT strategy with business strategy is to establish a strong team comprising of IT people that understand business.

**Clear Goals and Objectives**

Successful ERP implementation requires decision makers throughout the organization to create a clear vision which shows how company should work in order to satisfy customers and empower employees for the next three to five years. According to Umble et al., (2003) ERP systems are considered as IT tools for improving business performance. One of the most important issues in improving the business performance is a plan to show the current situation of the organization and the vision and strategies that can take the organization to the right place (Al-Mashari et al., 2003). Luftman and Brier (1999) point out that the IT manger should understand the business process. In fact maximizing the alignment of business and IT strategies is crucial for reaching the organizational vision.

According to Plant and Willcocks (2007) clear goals and objectives enhance the new business and have a positive effect on project team capability. Umble et al., (2003) mentioned that unfortunately many CEO’s view ERP as a simple software and they do not realize that ERP may fundamentally change the way organizations operate.

**Business Process Re-engineering**

One of the challenges during the implementation process is incompatibility of features with business processes and organization’s information. Thereby to achieve the advantages of an ERP system it is necessary that organizations align the business to fit the ERP system with minimal customization (Sommer and Nelson, 2001).

Yusuf et al., (2004) findings on Rolls-Royce case study noted that SAP R/3 required a strict business process. The implementation team understands the business process should be modified
to fit SAP. They achieved this by applying Business Process Re-engineering in four stages. The first step was to draw a map of current business process; the second step was to identify the potential problems with the current system. The third step involved applying some of the current problem by SAP demonstration. The final step encompasses re-mapping and modification the new system.

**Vendor Support**

According to Somer and Nelson (2001) ERP system is not a onetime installation and there always are new modules and versions that fit better with the organization. Consequently, there should be long term commitment between the vendors and customers. As noted by the alluded authors the support can be technical assistance, emergency maintenance, updates and special user training.

Umble et al., (2003) noted that vendor support starts from installation, training and this support will continue to post implementation stages. Plant and Willcocks (2007) findings on the case studies show that strong vendor relationships and support were extremely important throughout the implementation process.

**Effective Communication**

Effective communication is not only important within the project team but it is also important between teams and rest of the organization (Somer and Nelson, 2001). Umble et al., (2003) found an interesting result that effective communication was a major issue throughout the project and many employees recommended a stricter control for staff that does not use the system correctly for communication.

Yusuf et al., (2004) findings emphasize on the key role of communication in a successful ERP system. The legacy system did not have the ability to have online communication with customers, partners and vendors. The case discussed in the article shows direct communication with suppliers is vital when the organization is committed to deliver goods. Additionally, shop floor communication with line works was one of the activities that had taken place during the implementation which was vital to the success of the project.
**Project Champion**

The success of ERP implementation has been linked to the presence of a knowledgeable and reputed person in an organization. As suggested by Somer and Nelson (2001) project champion should understand technology as well as the business and organizational context. He should also solve the problems and manage the problems in the team (Nah et al., 2001).

Yusuf et al., (2004) did not mention directly about the accountable and trustworthy person with successful past accomplishment that should be placed as a project leader. But it is understandable from the case that within the project team there are specialist managers that have both vital cross-functional knowledge and sufficient knowledge of the legacy system.

**Monitoring and Evaluation of Performance**

The evaluation should show how the system is performing and it should be measured against the project objectives (Nah et al., 2001). Umble et al., (2003) stated that performance measures should show how the new system is working, and example of this measure includes on-time delivery, gross profit margin, inventory turns, vendor performance, etc. The authors also put light on the issue and suggest that evaluation process should start from the pre-implementation stage and continue to post-implementation stage.

Kamhawi and Gunasekaran (2009) proposed that IS manager’s perception of ERP implementation success is more associated with project success metrics, while non-IS managers view of success is more related to business value metrics and user satisfaction. But the survey from twenty organizations shows there is no evidence found to support the hypothesis. It means that IS and non-IS manger have comprehend the similar level of success for each dimension of ERP success.

Al-Mashar et al., (2003) suggest that regular auditing can be considered for optimization of the potential available business in all scopes. External benchmarking can also generate new ideas and knowledge that the current ERP system is challenging with.

Yusuf et al., (2004) findings on Rolls-Royce case also had a different system for controlling and evaluation of performance of commercial, financial, and procurement functions. These systems
had difficulty interacting with each other as they had specific data bases but upon integrating these, overall performance had been evaluated.

**Data Accuracy**

The importance of data accuracy and correct data entry is one of the important factors in successful ERP implementation. ERP systems integrate the information of entire organization thus incorrect data entry in one unit might negatively affect the operation of other units. Therefore Umble et al., (2003) mentioned in their research that employees must work within the system not around the system. He also pointed out that everyone in the organization should be convinced to use the new system. Furthermore, Umble et al., (2003) suggested that in order to enforce this commitment it is better to eliminate the legacy system.

Further research on data accuracy shows that some organizations set up a Quality Assurance environment from implementation to post-implementation stage to ensure accuracy and precision of data (Kumar et al., 2003). Yusuf et al., (2004) findings on Rolls-Royce case show that employees did not trust the data because the legacy system did not provide accurate, consistent and accessible data. However, the case studies in this research indicated that providing accurate and reliable information played a pivotal role in project success.

3.3) **Perceptions of Different Stakeholders**

Kossek (1989) points out that while focusing on the perception of management about an innovation, the perceptions of other important groups like end-users might be neglected. In his research, Gyampah (2004) has deployed case study approach to compare the perceptions of managers and end-users and discussed the implications of these differences for attaining ERP success. Gyampah (2004) has concluded that signification differences exist between these two groups. It is also concluded that these different perceptions exist about the benefits related with the technology and the effectiveness of implementation activities that are conducted as a part of the implementation process.

Major findings by Gyampah (2004) show that managers have a more positive attitude towards the “benefits of technology, the effectiveness of communication mechanisms and their level of satisfaction with the technology” as compared with end-users. Other areas of differences are
“perceived effectiveness of training provided as a part of implementation effort, personal satisfaction with technology and perceived ease of use of technology” (Gyampah, 2004). One of the reasons for these different perception quoted by Gyampah (2004) is the closeness of managers to “decision-making process” that they have more information and understanding of the technology being implemented.

In another interesting article, Nah and Lau (2003) have studied that perception of Chief Information Officer’s perspective of critical success factors for ERP implementation. The top five critical success factors for ERP implementation according the rankings given by CIOs are: “top management support, project champion, ERP teamwork and composition, project management, and change management program and culture (Nah and Lau, 2003). The next group of important factors is communication, business plan and vision, BPR, software development, testing and troubleshooting, and monitoring and evaluation of performance (Nah and Lau, 2003).”

Nah and Lau (2003) have also compared the empirical findings with the findings of reviewed literature to identify any deviations or gaps between the literature and real-time data. It is concluded by Nah and Lau (2003) that the ranking of success factors obtained through surveys is in sync with to the literature review with minor deviations in the few factors.

Kamhawi (2009) adopted another categorization, information systems managers (IS managers) and non-information managers (Non-IS managers), to examine their perceptions of success of ERP implementation. This research was limited to IS and non-IS managers of Bahraini enterprises. Meaning of ERP success did not differ much between IS and non-IS managers as concluded by Kamhawi (2009). This findings is surprising as many researchers and academicians asserted that IS managers applies “system building way or product oriented” for evaluating the ERP success (Jiang, et al., 2005). On the contrary, Jiang, et al. (2005) evaluated that non-IS managers applies “level of satisfaction or service-oriented” for assessing the success of ERP systems.

Surprisingly, Kamhawi (2009) study challenged the above findings and asserted that IS as well as non-IS managers consider “level of satisfaction and business value” as the major criteria to
evaluate the ERP success. And, “project success” dimension is not critical according to managers while doing the ERP evaluation (Kamhawi, 2009).

According to Kamhawi (2009), in Bahrain enterprise the perceptions of these groups for the factors of ERP success are same only for “resistance and organizational fit”. It is concluded by Kamhawi (2009) that IS managers rated following factors important: “ease of use, training and technical fit” respectively. While the non-IS managers viewed “competitive pressures, strategic fit and business process re-engineering” as the critical factors for ERP success (Kamhawi, 2009).

Previous literatures established that stakeholder groups of business managers and IT professionals measure “organizational-IT issues” differently. These differences are attributed to a wide variety of reasons namely cultural difference and influences arising from difference in organizational power. Paper published by Ifinedo and Nahar (2007) studied the existing literature to analyze whether any differences exist between these groups in their prioritization and evaluation of ERP systems success using empirical data. Ifinedo and Nahar (2007) used the definition of ERP success as utilization of IT systems to enhance organizational effectiveness given by Meyers, et al. (1997) and Gable, et al. (2003).

The six dimensions on which ERP success is measured include information quality (IQ), system quality (SQ), individual impact (II), organizational impact (OI), vendor/consultant quality (VQ) and workgroup quality (WQ) (Ifinedo, 2006a). The findings of this research are quite different from prior literatures. This study found that no differences exists how business managers and IT professionals prioritize and evaluate ERP success. Only exception being dimensions of ERP success: vendor/consultant quality and business managers rate VQ higher than their IT counterparts (Ifinedo and Nahar, 2006).

In this article, Sedera, et al. (2004) studied the importance of multiple stakeholder’s perspective for assessing the ERP success. Different public sector organizations are interviewed to assess the difference in perception of stakeholders. Many stakeholders groups are identified in this paper and Sedera, et al. (2004) classified the stakeholders into four stakeholder groups for assessing ERP system: a) Strategic, b) Management, c) End users and d) Technical staff. For assessment of ERP success, Sedera, et al. (2004) used an ERP success model which has four quadrants a) Individual Impact b) Organization Impact c) System Quality and d) Information Quality.
The research conducted by Sedera et al, (2004) captured the responses of various public sector organizations and concluded that there is no significant difference in the perception of four stakeholders about the quality of information received from the ERP system. “In relation to the ES success dimensions, technical and strategic employment group displayed significant differences in system quality, individual impact and organizational impact (Sedera et al, 2004).” Management and operational group do not show any difference in the views on ERP success dimensions. It is also founded by Sedera, et al. (2004) that technical staff emphasizes on system quality dimension more that any other group and strategic group focuses more importance on organizational impact dimensions.

**Top Management**

Many researchers including Nah et al. (2001), Plant and Willcocks (2001) and Dong (2001) have concluded that top management support and commitment is extremely important for organizations embarking on ERP implementation. According to Umble et al. (2002), ERP implementation project should form “executive management planning committee” which understands the ERP benefits, supports the cost involved, focuses in enterprise integration and champions the project because executive level inputs are important for analyzing and rethinking business processes. It is clearly mentioned by Al-Mashari et al., (2003) that top management should plan the vision, give the direction for business and Nah et al., (2001) emphasized that new organizational structures, roles and responsibilities should be established by top management. Nah et al., (2001) stressed that goals of ERP should align with the strategic goals of the organization and top management should be supporting the entire implementation process. Al-Mashari et al., (2003) also highlighted that top management support and commitment is not required for only initiation and facilitation but it is the responsibility of the top management to be available throughout the implementation process.

Al-Mashari et al., (2003) also pointed out that top management should effectively handle the change management brought by ERP implementation. The top management should also be open to modern ideas, know the benefits of growing the business through innovation and best practices (Al-Mashari et al., 2003). The case studies analyzed by Al-Mashari et al., (2003) showcase that key for successful ERP implementation is effective change management from top.
The benefits of intervention from management helps in faster and effective decision making, faster conflict resolution and brings the thought process of everybody on the same level, promotes the acceptance of project across the organization and improves co-operation among the diverse groups involved in implementation project (Al-Mashari et al., 2003). Additionally, top management should be responsible for formulating the new policies for setting up the new system in the organization. In case of conflict of interest, it is the duty of the top management to mediate between the parties (Nah et al., 2001)

It can be concluded after studying the various literatures that top management has a very critical role to play in successful ERP implementation process. Their continuous support and commitment for the implementation process have serious impact on the implementation process. Therefore, while dividing the organization into different stakeholder groups, the top management takes the first and topmost place among the stakeholders.

**Middle Management**

The outcomes of innovative implementation efforts depend largely on the reactions of managers and also end users. The main reason why many implementations fail is because they rely heavily on data gathering, analysis, report writing and presentations. Instead they should rely on gathering the feelings of managers which motivate useful actions (Lin, F. & Rohm, C.E.T., 2009). According to Dong (2001) lack of shared understanding between business managers contribute to implementation difficulties. Also, effective ERP implementation requires appropriate managerial interventions as a part of the implementation process. For example, managers being a part of project team might consider minutes of project team meeting as an effective way of team communication whereas employees who are not a part of project team may not think so and may desire more effective ways of communication (Dong, 2001). According to Gyampah (2004) project managers and team leaders have a more positive attitude towards the ERP systems than the end users. Ifinedo and Nahar (2007) also suggest that the managers should always be involved in processes like user training for better results during ERP implementation. This is also supported by Willcocks and Sykes (2000), they further suggest that managers have three characteristics which distinguish them from others; they have credibility...
among different stakeholders, they have a track record of success and they have skills to control actions needed to keep a project on track.

According to all the literature researched above we can say that the managers play a very critical role in the implementation of ERP, so their perspectives should always be given high priority.

**End-Users**

Various studies indicate that user satisfaction is one of the critical evaluation criteria for determining ERP implementation success. Hirt and Swanson (1999) in their research on ERP implementation process define users as two main types, Key-user and End-user. Key-users are selected from operating departments and usually know the business process and they generally act as trainer, help-desk, resources and change agents. In contrast to key-users, end-users are only specialized on a specific part of the system that is related to their work. Therefore, Wu and Wang (2005) in their research looked at key-user satisfaction as means of determining system success. The authors find a positive correlation between key-user satisfaction and system success. In addition they present a model for measuring key-user satisfaction in an ERP environment which encompasses three factors: ERP product, contractor service, knowledge and involvement. It is noticeable that the authors strongly believe that in order to assess the overall ERP success all the three factors should be taken into consideration. In fact in ERP implementation assessment the three alluded factors are interwoven, and one should not focus exclusively on one specific factor. Lin and Rohm (2009) pointed out that there are differences between how managers and end-users perceive the effectiveness of factors of successful ERP implementation. More over Lin and Rohm (2009) mentioned that the difference in perception between managers and end-user depends on whether ERP system allows the functional units to work effectively with each other. Gyampah (2005) also stated that as the end users are not aware of the complete benefits of the technology and its impact on communication, they tend to have less favorable perception of new technology than managers.

To sum up, the above facts indicate that different stake holders have different perceptions and criteria for a system’s success. Therefore, end-user view should be taken into account while assessing the overall ERP implementation success.
3.4) ERP Implementation Phases

Madsen and Ehie (2005) designed a five-stage ERP implementation model with following stages: project preparation, business blueprint, realization, final preparation, go-live and support. In another paper by Rajagopal P. (2002) the ERP implementation process is divided into initiation, adoption, adaptation, acceptance, routinization, and infusion.

ERP implementation models are also designed by ERP consultants such as Infosys Technologies Ltd., Accenture, IBM etc. In one such article, Infosys’s Kotamraju V. (2008) talks about Infosys Technologies Ltd. package implementation methodology (Intrak) which explains the different stages in a typical ERP implementation process. Two broad-level stages are strategic stage and project stage having sub-stages as planning, package evaluation, organizing and project scoping, requirement gathering, to-be process design, configuration & development and cut-over & support respectively.

Other researcher, Ross J.W (2002), have also described five-stage ERP implementation model including implementation, stabilization, continuous improvement and transformation. One of the thesis conducted by Yanhong Z (2009) for studying the key success factors for EFRP implementation process categorized the process into four phases: planning, implementation, stabilization and improvement. Another widely used categorization divides the implementation process into four phases namely chartering, project, shake-out, onward and upward (Marcus M.L. et al., 2000 ; Nah et al., 2001).

After collating the different ERP implementation models by different researchers, it becomes extremely important to select one model that would be used throughout the research process (Fisher 2007, p.126). Some of the models examine the ERP life cycle beyond implementation stages which out of the scope of this research. Therefore, the model given by Madsen and Ehie (2005) would be used for further research, analysis and reference as it has divided the implementation process in various sub-stages that are limited to implementation process only.

The different stages of five stage model given by Madsen and Ehie (2005) are explained below:

**Phase 1: Project Preparation**
This is the planning phase of the process which involves identification of leadership team and project team. As the process is exhaustive in nature and can go hay-wire at any stage, the scope and vision should be clearly understood. Also, the budget estimates need to be done at this stage as implementation processes are quite expensive and involves huge IT expenditure. By the end of this stage, the complete project layout/plan for planning the implementation and assignment of responsibilities should also be drafted.

**Phase 2: Business Blueprint**

This phase is required for selecting the ERP package that meets the requirements of an organization. Selection process would be based on how clearly an organization knows its current business processes. Flowcharts and diagrams should be used for better presentation of the process flows. One of the most important learning at this stage is that no ERP package provide exact match to the current business processes and gaps always exist; new business design for mapping the gaps need to be understood in order to reap the maximum benefits of ERP systems.

**Phase 3: Realization**

Once the business process flows are checked and verified by the respective teams, the next stage involves the technical development of the same. The technical codes need to be created at this stage for transforming the functional requirements to technical specifications. Documentation is extremely important at this stage as many iteration steps would be involved in the technical process and maintaining every iteration step would improve the transparency and accountability. Simultaneously, the process design would be tested in conference room pilot and this step would give confirmation signal for the process design completion.

**Phase 4: Final Preparation**

This stage is basically the testing phase of the process. The entire end-to-end process integration would be tested by loading the huge volumes of data. The performance of the applications would be analyzed under extreme situations and required modifications would be incorporated in the technical design. This stage assesses the robustness of the ERP package and helps in fine-tuning
of applications. Training and education of business users is undertaken at this step. Making the users familiar and adapt to the applications helps in technology acceptance among the organization.

**Phase 5: Go Live and Support**

At this stage, the ERP system is handed over to the organization and ERP modules go live for carrying business activities. ERP system is not an application that once implemented would close the implementation process. It is a continuous process for optimization and expansion of the system to gain new competitive advantage.
Illustration 7: A five-stage ERP implementation process (Source: Ehie and Madsen, 2005)
3.5) Relationship between Concepts

As noted by Boudreau and Robey (2002), if ERP systems are not successfully implemented, it may lead to costly duplication of efforts and in worst cases system failure. The high failure rate of ERP systems call for a better understanding of the key factors for its successful implementation (Somers, et al., 2001). In some conceptual frameworks the concepts are related as stages in a process. These relationships are not cause and effect but on logic and proper order (Fisher, 2007). In case an organization wants to implement an enterprise resource planning system it has three main phases i.e. Pre Implementation, Implementation and Post Implementation. The focus of this thesis is on the implementation phase, the different stages in the implementation phase and the key factors influencing these stages. As we understand the importance of a phased implementation approach for the successful implementation and maintenance of ERP systems. It is important for the management to conduct a review at the end of each stage before going on to the next stage, without such linkages it is extremely tough and costly to go back and correct the mistakes (Ehie and Madsen, 2005).

Lin and Rohm (2009) researched that the introduction of innovation such as ERP systems in an organization brings uncertainty and insecurity because there is a potential need to change the processes, responsibilities and performance requirements. Proper management is the key to the successful introduction of the innovation. Lin and Rohm (2009) mentioned that mostly ERP implementations focus on the processes involved such as requirement gathering, presentations and conference room pilot etc. Therefore, they stressed that “a more creative approach should be employed to grab the feelings of managers and end-users to smoothen the process of innovation introduction”. Another interesting article by Lim et al (2005) also underlined that ERP adoption entails significant degree of complexities and coordination among departments. They also identified that “acceptance of ERP systems among the targeted users is crucial determinant of the strategic application of the systems”. Gyampah (2004) also studied the perceptions of several stakeholders including top management, project managers, team users, end users, trainers, consultants and vendors that are involved in the implementation of ERP. All the stakeholders have their own interests and understanding to the ERP systems and thus, in order to successfully implement the ERP systems need to consider the different stakeholders viewpoint is inevitable (Gyampah, 2004). After analyzing the various research papers, we determined that for studying
the ERP implementation and its key factors for success, it would be more challenging as well as interesting to incorporate a third dimension of stakeholders perceptions to our research.

Our conceptual framework model (Illustration 5) shows the different stages involved in an ERP implementation process referred from Madsen and Ehie (2005). Inside the stages, we included the perceptions of the three stakeholders’ groups’ namely top management, middle management and end-users. This framework is based on the premise that by taking into consideration the perceptions specific to each stage of the process, ERP implementation success rate can be improved. After our analysis, we would be modifying the diagram to incorporate our findings to give a pictorial representation of the same.

4) RESEARCH DATA

This chapter displays the data for critical success factors on the basis of various researchers and empirical data for the selected factors gathered through a questionnaire.

Secondary Data

Illustration 6 of this thesis summarized the frequency of the critical success factors for ERP implementation on the basis of different research papers. Since this thesis involves the analysis of perceptions of different stakeholders, various illustrations would be provided in this chapter to categorize these CSFs into each stakeholder group.

Illustration 8 represents the data collated for top management group from the three research papers namely Ifinedo et al (2006), Nah et al (2003) and Lian (2001). To collect this data, the difficult part was that different researchers have used different terms for the same factors in their respective papers. This made it a bit complicated to map these factors to the factors selected for gathering empirical data. For facilitating the analysis, the factors which have different terms but similar meanings are highlighted by the same color in illustration 8. The different factors in research papers which are not relevant to our selected key factors have been striked-off in the illustrations.
Illustration 8-Top Management Perception Based on Secondary Data

The above process for choosing the critical success factors is used for illustration 9 as well as 10 which shows the secondary data for middle management and end-users respectively. For middle management, illustration 9 shows the CSFs criticality according to following papers: Ifinedo et al (2007), Kamhawi et al (2009), Ifinedo et al (2006), Gyampah (2004) and Lin (2009). For end users illustration 10 shows the CSFs criticality according to following papers: Gyampah (2004) and Lin (2009).

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
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<td>Project planning</td>
<td>5</td>
<td>Information quality involves monitoring and evaluation of performance</td>
<td>5</td>
<td>communication</td>
<td>5</td>
<td>Argument for change (Change Management)</td>
<td>5</td>
</tr>
<tr>
<td>System quality involves ease of use</td>
<td>4.5</td>
<td>ERP Overall success and top management</td>
<td>4.6</td>
<td>System quality involves ease of use</td>
<td>4.6</td>
<td>personal relevance</td>
<td>4</td>
<td>communication</td>
<td>4.5</td>
</tr>
<tr>
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<td>4.3</td>
<td>Training</td>
<td>4.3</td>
<td>System quality referring to data accuracy</td>
<td>4.3</td>
<td>Argument for change (Change Management)</td>
<td>4</td>
<td>satisfaction with technology</td>
<td>4</td>
</tr>
<tr>
<td>Vendor/consultant quality involves referring to experienced consultants</td>
<td>4</td>
<td>ERP composite score</td>
<td>4</td>
<td>Vendor/consultant quality referring to experienced consultants</td>
<td>4</td>
<td>satisfaction with technology</td>
<td>4</td>
<td>Personal relevance</td>
<td>4</td>
</tr>
<tr>
<td>Vendor/consultant quality referring to implementation teams</td>
<td>4</td>
<td>strategic and organizational fit</td>
<td>4</td>
<td>Vendor/consultant quality referring to implementation teams</td>
<td>4</td>
<td>training</td>
<td>3.5</td>
<td>Training</td>
<td>3.5</td>
</tr>
<tr>
<td>Workgroup impact involves effective communication</td>
<td>3.5</td>
<td>ERP user level satisfaction and ease of use</td>
<td>3.6</td>
<td>Workgroup impact involves effective communication</td>
<td>3.6</td>
<td>shared belief</td>
<td>3</td>
<td>Ease of use</td>
<td>3</td>
</tr>
<tr>
<td>Individual impact referring to training needs</td>
<td>3</td>
<td>Competitive Pressure</td>
<td>3.3</td>
<td>Individual impact referring to training needs</td>
<td>3.3</td>
<td>Ease of use</td>
<td>2.5</td>
<td>shared belief</td>
<td>2.5</td>
</tr>
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<td>2.5</td>
<td>Technical fit</td>
<td>3</td>
<td>Organisational Impact referring to organization wide changes required</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organisational Impact referring Business process re-engineering</td>
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<td>Business process re-engineering</td>
<td>2.6</td>
<td>Organisational Impact referring Business process re-engineering</td>
<td>2.6</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Resistance</td>
<td>2.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Illustration 9-Middle Management Perception Based on Secondary Data
The factors in the data represented in illustrations 8, 9 and 10 were rated on different scales by different authors but we scaled the ratings of all the factors on a scale of 1 to 5 where 5 represent the highest criticality and 1 the lowest. This was done so as to make the analysis of secondary data versus primary data more transparent and easy to understand. Since very less literature is available for end-users perceptions, the illustration 11 has only 2 researchers namely Gyampah (2004) and Lin (2009) who’s CSFs are used for data collection.

**Primary Data**

This section would provide the details about the primary data that has been collected using the questionnaire that was sent to different organizations. The questionnaire was sent to more than ten organizations but we did not get a response from all the organizations. We still managed to get responses from around eight organizations. In all 40 questionnaires were sent, out which we received 18 responses that gave us a response rate of 45%. Some of the responses we got were incomplete; some of the responses looked fake as they had only one option marked for all the choices so they were not included while doing the analysis.

The below Pi chart shoes the number of responses from each stake holder group.
After short listing all the accurate and complete responses, for each respondent a simplified view of the questionnaire was created. This table for each respondent included all the factors and their criticality, the factors important at each phase, the organization from which we got the response and the designation of the employee who answered the questionnaire. An example of this table has been provided in illustration 12.

<table>
<thead>
<tr>
<th>Designation</th>
<th>Organization</th>
<th>Critical factors</th>
<th>Criticality</th>
<th>Phases</th>
<th>Factors</th>
</tr>
</thead>
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<td>PL Engineering Ltd.</td>
<td>top mgmt support &amp; commitment</td>
<td>5</td>
<td>Project Preparation</td>
<td>top mgmt support &amp; commitment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>org change mgmt</td>
<td>5</td>
<td></td>
<td>org change mgmt</td>
</tr>
<tr>
<td></td>
<td></td>
<td>project mgmt</td>
<td>3</td>
<td></td>
<td>Clear goals and objective</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Redution and training</td>
<td>3</td>
<td>Business Blueprint</td>
<td>Implementation team</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Implementation team</td>
<td>2</td>
<td></td>
<td>Clear goals and objective</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Clear goals and objective</td>
<td>4</td>
<td></td>
<td>Business process reeng</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Business process reeng</td>
<td></td>
<td>Realization</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vendor Support</td>
<td>2</td>
<td></td>
<td>Vendor Support</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Effective comm</td>
<td>4</td>
<td></td>
<td>project champion</td>
</tr>
<tr>
<td></td>
<td></td>
<td>project champion</td>
<td>3</td>
<td>Final preparation</td>
<td>Education and training</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Monitoring and evaluation of proformance</td>
<td>4</td>
<td></td>
<td>Effective comm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Data Accuracy</td>
<td>5</td>
<td></td>
<td>Monitoring and evaluation of performance</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Go live and support</td>
<td>Vendor Support</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Monitoring and evaluation of performance</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Data Accuracy</td>
</tr>
</tbody>
</table>

Illustration 12-Response Example (Source: Questionnaire Survey)
After tabulating each response we created three more tables one for each level of organization. Every table included the twelve factors and all the responses that we got from that organizational level. These tables have been shown below in the below illustrations 13, 14 and 15.

<table>
<thead>
<tr>
<th>Top Manager/Response</th>
<th>Response 3</th>
<th>Response 9</th>
<th>Response 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top management support &amp; commitment</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Organizational change management</td>
<td>4</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Project management</td>
<td>4</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Education and training</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Implementation team</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Clear goals and objective</td>
<td>5</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Business process reengineering</td>
<td>4</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Vendor Support</td>
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<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Effective commitment</td>
<td>3</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>project champion</td>
<td>4</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Monitoring and evaluation of performance</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Data Accuracy</td>
<td>3</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

Illustration 13: Rating of CSFs by Top management (Source: Survey Questionnaire)

<table>
<thead>
<tr>
<th>Middle Manager/Response</th>
<th>Response 1</th>
<th>Response 2</th>
<th>Response 3</th>
<th>Response 4</th>
<th>Response 5</th>
<th>Response 6</th>
<th>Response 14</th>
</tr>
</thead>
<tbody>
<tr>
<td>top mgmt support &amp; commitment</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>org chnge mgmt</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>project mgmt</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Education and training</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Implementation team</td>
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<td>4</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Clear goals and objective</td>
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<td>3</td>
<td>5</td>
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<td>5</td>
</tr>
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<td>3</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Vendor Support</td>
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<td>2</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Effective comm</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>project champion</td>
<td>3</td>
<td>0</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Monitoring and evaluation of performance</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Data Accuracy</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

Illustration 14: Rating of CSFs by Middle management (Source: Survey Questionnaire)
Illustration 15: Rating of CSFs by End-Users (Source: Survey Questionnaire)

5) ANALYSIS

This chapter analyses the secondary and primary data collected in above chapter along with the difference in perspectives of the different stakeholders. Key factors for each stage of ERP implementation are also analyzed in this chapter using empirical data collected.

The above chapter shows the criticality of CSFs categorized for different stakeholders through primary and secondary data. Based on these, further tables were drawn to summarize the criticality of each factor. For example, by using illustrating 8, illustration 16 was prepared to summarize the CSFs for top management. First column of the illustration 16 shows the 12 factors that were selected for this research. Correspondingly, column 2, 3 and 4 shows the criticality of these factors according to different researchers. The last column of illustration 16 calculated the average rating for each factor.
Similarly, illustrations 17 and 18 are prepared for middle management and end-users by using illustrations 9 and 10 respectively. These illustrations calculate the averages of each factor according to secondary data collected.

Illustration 16-Average Rating of CSFs by Top Management (Secondary Data)

<table>
<thead>
<tr>
<th>Factors</th>
<th>Researchers</th>
<th>Ihnedo et al, 2006</th>
<th>Nah et al, 2003</th>
<th>Lian, 2001</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top Management Support</td>
<td>-</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5.00</td>
</tr>
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<td>3.5</td>
<td>3.5</td>
<td>3.37</td>
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</tr>
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<td>Project Management</td>
<td>-</td>
<td>4</td>
<td>4.75</td>
<td>4.38</td>
<td></td>
</tr>
<tr>
<td>Education and training</td>
<td>2.5</td>
<td>-</td>
<td>3</td>
<td>2.75</td>
<td></td>
</tr>
<tr>
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<td>4.3</td>
<td>4</td>
<td>4.27</td>
<td></td>
</tr>
<tr>
<td>Clear goals and objectives</td>
<td>-</td>
<td>3</td>
<td>4.5</td>
<td>3.75</td>
<td></td>
</tr>
<tr>
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<td>3.25</td>
<td>2.95</td>
<td></td>
</tr>
<tr>
<td>Vendor Support</td>
<td>4.5</td>
<td>-</td>
<td>3.75</td>
<td>4.13</td>
<td></td>
</tr>
<tr>
<td>Effective Communication</td>
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<td>3.3</td>
<td>2.5</td>
<td>3.10</td>
<td></td>
</tr>
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<td>Project Champion</td>
<td>-</td>
<td>4.6</td>
<td>4.25</td>
<td>4.43</td>
<td></td>
</tr>
<tr>
<td>Monitoring and evaluation of performance</td>
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<td>2.3</td>
<td>2.75</td>
<td>3.35</td>
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</tr>
<tr>
<td>Data accuracy, reliability</td>
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<td>-</td>
<td>-</td>
<td>4.00</td>
<td></td>
</tr>
</tbody>
</table>

Illustration 17-Average Rating of CSFs by Middle Management (Secondary Data)

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td>3.36</td>
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<tr>
<td>Project Management</td>
<td>-</td>
<td>5</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>5.00</td>
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</tr>
<tr>
<td>Education and training</td>
<td>3</td>
<td>4.3</td>
<td>3</td>
<td>3.5</td>
<td>3.5</td>
<td>3.46</td>
<td></td>
</tr>
<tr>
<td>Implementation Team</td>
<td>4</td>
<td>-</td>
<td>4</td>
<td>-</td>
<td>-</td>
<td>4.00</td>
<td></td>
</tr>
<tr>
<td>Clear goals and objectives</td>
<td>-</td>
<td>4</td>
<td>-</td>
<td>3</td>
<td>2.5</td>
<td>3.17</td>
<td></td>
</tr>
<tr>
<td>Business Process Re-engineering</td>
<td>2.5</td>
<td>2.6</td>
<td>2.5</td>
<td>-</td>
<td>-</td>
<td>2.53</td>
<td></td>
</tr>
<tr>
<td>Vendor Support</td>
<td>4</td>
<td>-</td>
<td>4</td>
<td>-</td>
<td>-</td>
<td>4.00</td>
<td></td>
</tr>
<tr>
<td>Effective Communication</td>
<td>3.5</td>
<td>-</td>
<td>3.5</td>
<td>5</td>
<td>4.5</td>
<td>4.13</td>
<td></td>
</tr>
<tr>
<td>Project Champion</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Monitoring and evaluation of performance</td>
<td>5</td>
<td>-</td>
<td>5</td>
<td>-</td>
<td>-</td>
<td>5.00</td>
<td></td>
</tr>
<tr>
<td>Data accuracy, reliability</td>
<td>4.5</td>
<td>3</td>
<td>4.5</td>
<td>4</td>
<td>4</td>
<td>4.00</td>
<td></td>
</tr>
</tbody>
</table>
Illustration 17-Average Rating of CSFs by Middle Management (Secondary Data)

<table>
<thead>
<tr>
<th>Factors</th>
<th>Researchers</th>
<th>Gyampah, 2004</th>
<th>Lin, 2009</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top Management Support</td>
<td></td>
<td>-</td>
<td>-</td>
<td>NA</td>
</tr>
<tr>
<td>Organizational Change Management</td>
<td>2.5</td>
<td>3</td>
<td></td>
<td>2.75</td>
</tr>
<tr>
<td>Project Management</td>
<td></td>
<td>-</td>
<td>-</td>
<td>NA</td>
</tr>
<tr>
<td>Education and training</td>
<td>4</td>
<td>4.5</td>
<td></td>
<td>4.25</td>
</tr>
<tr>
<td>Implementation Team</td>
<td></td>
<td>-</td>
<td>-</td>
<td>NA</td>
</tr>
<tr>
<td>Clear goals and objectives</td>
<td>3.5</td>
<td>3.5</td>
<td></td>
<td>3.50</td>
</tr>
<tr>
<td>Business Process Re-engineering</td>
<td></td>
<td>-</td>
<td>-</td>
<td>NA</td>
</tr>
<tr>
<td>Vendor Support</td>
<td></td>
<td>-</td>
<td>-</td>
<td>NA</td>
</tr>
<tr>
<td>Effective Communication</td>
<td>3</td>
<td>2.5</td>
<td></td>
<td>2.75</td>
</tr>
<tr>
<td>Project Champion</td>
<td></td>
<td>-</td>
<td>-</td>
<td>NA</td>
</tr>
<tr>
<td>Monitoring and evaluation of performance</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>NA</td>
</tr>
<tr>
<td>Data accuracy, reliability</td>
<td>5</td>
<td>4</td>
<td></td>
<td>4.50</td>
</tr>
</tbody>
</table>

Illustration 18-Average Rating of CSFs by End-User (Secondary Data)

Based on the primary data that has been collected and shown in the above chapter below table was created. In the below table first column corresponds to the factors that were used to collect the empirical data, the second column corresponds to the averages taken for each factor in the top management group from illustration 13, the third column corresponds to the averages taken for each factor in the middle management group from illustration 14 and the last column corresponds to the averages taken for each factor in the end user group from illustration 15.
### Factors/Response Average

<table>
<thead>
<tr>
<th>Factors/Response Average</th>
<th>Top Management</th>
<th>Middle Management</th>
<th>End User</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top mgmt support &amp; commitment</td>
<td>5.00</td>
<td>4.60</td>
<td>3.00</td>
</tr>
<tr>
<td>Organizational change management</td>
<td>4.33</td>
<td>4.00</td>
<td>2.29</td>
</tr>
<tr>
<td>Project management</td>
<td>4.67</td>
<td>4.80</td>
<td>2.86</td>
</tr>
<tr>
<td>Educat and training</td>
<td>2.67</td>
<td>3.80</td>
<td>4.86</td>
</tr>
<tr>
<td>Implementation team</td>
<td>4.00</td>
<td>3.60</td>
<td>4.43</td>
</tr>
<tr>
<td>Clear goals and objective</td>
<td>4.33</td>
<td>4.20</td>
<td>4.71</td>
</tr>
<tr>
<td>Business process reengineering</td>
<td>3.00</td>
<td>2.60</td>
<td>2.86</td>
</tr>
<tr>
<td>Vendor Support</td>
<td>3.67</td>
<td>3.20</td>
<td>2.57</td>
</tr>
<tr>
<td>Effective communication</td>
<td>3.67</td>
<td>4.20</td>
<td>4.29</td>
</tr>
<tr>
<td>Project champion</td>
<td>4.67</td>
<td>3.00</td>
<td>3.57</td>
</tr>
<tr>
<td>Monitoring and evaluation of performance</td>
<td>4.00</td>
<td>3.80</td>
<td>3.86</td>
</tr>
<tr>
<td>Data Accuracy</td>
<td>3.67</td>
<td>4.00</td>
<td>4.57</td>
</tr>
</tbody>
</table>

Illustration 19 - Result of each stakeholder group (Primary Data)

### 5.1) Comparison between perspectives of different stakeholders

![Chart showing comparative perceptions about CSFs according to three stakeholder groups (Primary Data)](chart.png)

Illustration 20: Comparative Perceptions about CSFs according to three stakeholder groups (Primary Data)
The above illustration shows the comparison of the perspective of three organization stakeholders’ namely top management, middle management and end users. The above illustration is based on the primary data (illustration 19) that has been collected by asking questions about ERP implementation to professionals currently working in the industry. The data used is latest and genuine to our knowledge and hence we believe the results should be correct and accurate.

As can be seen in the above illustration according to the top management the most critical factors for ERP implementation are Top Management Support and Commitment, Organizational Change Management, Project management, Project Champion and Clear Goals and Objectives. All these factors have criticality more than 4 but top management support, project management and project champion have rating over 4.5. This shows that the top 3 factors are extremely critical for success to the Top Management stakeholders in the organization. Even the Middle Management considers top management support and project management extremely critical for success. This can be attributed to the fact that the top and middle managers consider only those factors important in which they are involved and have a critical role to play, they tend to ignore other factors like education and training which could be critical for an implementation success as a whole. But the end users have a totally different view, they consider Education and Training, implementation team and data accuracy extremely critical. Top management support, project management, organizational change management and project champion are among the least rated factors by the end users. Clear goals and objectives is the only factor which is considered critical by all three stakeholders and has a rating over 4 given by all. Factors like Business process reengineering and vendor support are considered least important by all three stakeholders. BPR has been given a rating of less than 3 by all stakeholders the reason for such a low rating can be that the organizations feel it is difficult to reengineer processes every time a new implementation takes place. There have been cases in organizations where there was resistance by the employees in adapting new techniques and processes.

Other factors like monitoring of evaluation and performance and effective communication have a high but not a very high rating of around 3.7 to 4.1 by all stake holders. These are the basic factors that are important for all kinds of implementations and processes and for everyone working in the organization.
5.2) Comparative Analysis of Primary and Secondary data

Top Management Perspective

In this section, graphical representation of criticality of key factors based on the perceptions top management is shown. Illustrations 21 and 22 show the bar graphs for secondary and primary data respectively according to the averages calculated in above section.

Illustration 21: Graphical Representation of Top Management Perspective (Secondary Data)
Illustration 22: Graphical Representation of Top Management Perspective (Primary Data)

From illustration 21 which shows the secondary data for top management perception, it can be seen that factors namely top management support, project management, project champion, implementation team and vendor support have got an average more than 4. Since criticality rating more than 4 represents highly important, these factors are of maximum significance for top management group according to researchers. Analysis of illustration 22 which represents the primary data for top management perception clearly reveals that factors of high importance for this group are top management support, project management, project champion, clear goals and objective and organizational change management. Out these factors three factors top management support, project management and project champion are considered highly important by both respondents as well as by researchers. Organizational change management is considered more important by respondents than researchers. The reason for this difference in perception can be attributed to practical changes required by organizations involved and researchers might have understated the importance of this factor. Therefore, according to researchers organizational change management along with clear goals and objectives, data accuracy, monitoring and evaluation of performance are of moderate importance for top management group. On the contrary, according to professionals the factors of moderate
importance for this group are effective communication, vendor support, monitoring and evaluation of performance, data accuracy and implementation team. The higher importance of implementation team and vendor support among researchers is highlighted in various ERP literatures. Bingi et al (1999) mentioned that best people should be selected for implementation team comprising of external consultants, internal staff and ERP vendors who can enhance the implementation process. However, for primary respondent, these two factors are lower on the criticality rating. The reason for this difference in their perceptions needs further research in this area.

The least important factors based on the perceptions of top management are education and training, business process re-engineering and effective communication. These least important factors are same for primary data except effective communication. Better importance of effective communication among organization’s top management (for primary data) might be seen as a positive step towards involving the entire organization to be a part of ERP transformation. Senior management might have understood the criticality of this factor for successful ERP implementation and therefore, this factor is rated as moderately important according to empirical data.

In a nutshell, the perceptions of top management according to researchers and respondents are more or less similar with few exceptions which are already analyzed above.

**Middle Management Perspective**

While conducting the literature review for this thesis, it became evident that researchers have focused on middle management’s perceptions in their researches. Comparison of middle management with top management (Ifinedo et al, 2006), end-users (Lin, 2009) or among different sub-groups in middle management like business managers versus IT managers (Ifinedo et al, 2007) have been extensively researched in past. The analysis covering perceptions of middle management based on primary and secondary data would help in finding the gaps, if any, in the past researches and current organizational environment.

Illustration 23 which is based on secondary data for middle management reveals the perceptions of this group. Similarly, illustration 24 shows the perceptions of the same group but for primary data. By comparing the two illustrations, project management, top management support and effective communication falls in the bracket of most important factors for ERP implementation for both the cases. Therefore, it can be said that researchers as well as professionals have accurately assessed the importance of these three factors. In illustration 24, according to professionals, clear goals and objective also serves as highly critical factor for ERP
implementation as compared to researcher’s opinion. One possible explanation for this difference could be that strategic planning for setting up goals and objective is done by top management group it should be clearly communicated and explained to the middle managers. Complete and clear understanding of these goals and objective would help middle managers to manage the implementation process smoothly.

Illustration 23: Graphical Representation of Middle Management Perspective (Secondary Data)
The importance of support from ERP vendor, strong implementation team, effective and appropriate training and explanation of changes required for ERP implementations has been well documented in literature (Lin, 2009; Gyampah, 2004). Even the responses of professionals in middle management group shows that they rate education and training and change management quite important for implementation process. Therefore, the next set of critical factors according to both the groups is vendor support, education and training, changes management and implementation team.

One factor that is on the lowest priority for both researchers and professionals is business process re-engineering. One possible explanation for such priority could be that actual benefits of BPR are still quite unclear in this group as well and therefore, this factor gets the lowest priority. Another explanation could be that middle managers have to communicate the need and importance of BPR to end-users so that they readily accept the changes made. So, it requires strong inter-personal and persuasive communication skills for this interaction. Managers might
be evading from this tricky and complicated part of implementation process and consequently, rate this factor on lower side.

Monitoring and evaluation of performance is rated highly by researchers whereas the professionals give it a low rating. The reason for this could be that researchers believe that whenever any process or implementation takes a very long time its performance should be monitored at regular intervals and from the start of the process. But since continuous monitoring and evaluation focuses on timely delivery with lesser no of errors so this factor can prolong the process but not hamper the process. The professionals in the middle management have rated this factor on a moderate level which shows that continuous monitoring and evaluation contribute to the success of ERP implementation to a lesser extent according to them.

**End-Users Perspective**

The number of research papers on end-users perceptions and attitudes for ERP or any other IT innovation found during literature review phase shows the post implementation perceptions researched by many academicians. End-user attitude, technology adoption from end-user perspective and end-user satisfaction etc are the examples of the research areas that discuss the end-users mostly in post - implementation environment. As the end-users are the ones who actually use the new technology post implementation, their perceptions about the critical factors for the implementation process are not studied much in the literature. It can be considered positive for this research as by analysis of empirical data new theories about end-users perception could be developed and proposed.

For secondary data, the Gyampah (2006) and Lin (2009) have studied the end-users attitude towards the critical success factors. Lin (2009) used the same factors as Gyampah (2004) to study the end-users perceptions in Chinese and US companies. But, the number of factors considered by these researchers is lesser than the factors for which empirical data is available. Illustration 25 shows the perceptions of end-users based on secondary data. By analyzing this illustration, data accuracy and reliability; and education and training takes the top slot and clear goals and objectives comes at moderate importance among all the factors according to end-users as researched by Gyampah (2006) and Lin (2009). Change management and effective communication are the least important factors. Since the number of research papers is very less
and factors considered by both the researchers are same, the clear rating of factors according to end-users perception is difficult to arrive at. Using the primary data for analysis, clear and generic view of end-users perceptions can be studied. New theories for end-users can be arrived at by analyzing the primary data.

Illustration 25: Graphical Representation of End User Perspective (Secondary Data)
Illustration 26 displays the perceptions of end-users based on primary data. According to the illustration, implementation team, clear goals and objectives, education and training and data accuracy are the most important factors. Implementation team, education and training and data accuracy factors have direct impact on the understanding and clarity of ERP implementation to end-users. Therefore, these factors are categorized as the most important. The factor clear goals and objective is generally considered more important for top management for strategic planning. But still, this factor is rated as most important by end-users. This deviation can be explained by analyzing the respondents in end-user segment. Few of them mentioned in the questionnaire that top management did not clearly foresee the goals and benefits of ERP systems post-implementation. This reduced the overall benefits and advantages of ERP systems and ERP was just seen as additional IT software.

Monitoring and evaluation of performance and project champion are the two factors of moderate importance to end-users.

Since the end-users are not aware of the best practices of doing business that are followed by other organizations, the importance of business process re-engineering is highly reduced in their perception. Consequently, BPR is among the least important factors according to end-users.
perceptions. Other factors in least importance category are vendor support, project management, organizational change management and top management support.

In short, based on primary data analysis end-users view those factors as important which have direct impact on them. This stakeholder group lacks the understanding of bigger and futuristic implications of ERP systems. Clear and effective communication to this group would improve their perceptions significantly.

### 5.3) Comparison of Perceptions of Different stakeholder groups at each stage of ERP implementation process

<table>
<thead>
<tr>
<th>Stakeholders/Phases</th>
<th>Project Preparation</th>
<th>Business Blueprint</th>
<th>Realization</th>
<th>Final preparation</th>
<th>Go live and support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top Management</td>
<td>Project Champion</td>
<td>Org. Change Management</td>
<td>Implementation Team</td>
<td>Vendor Support</td>
<td>Clear Goals and Objectives</td>
</tr>
<tr>
<td></td>
<td>Clear Goals and Objectives</td>
<td>BPR</td>
<td>Clear Goals and Objectives</td>
<td>Education and Training</td>
<td>Effective Communication</td>
</tr>
<tr>
<td></td>
<td>Project Management</td>
<td>Vendor Support</td>
<td>Education and Training</td>
<td>Data Accuracy</td>
<td>Monitoring &amp; Eval. of performance</td>
</tr>
<tr>
<td>Middle management</td>
<td>Clear Goals and Objectives</td>
<td>Clear Goals and Objectives</td>
<td>Effective Communication</td>
<td>Education and Training</td>
<td>Monitoring &amp; Eval. of performance</td>
</tr>
<tr>
<td></td>
<td>Org. Change Management</td>
<td>Implementation Team</td>
<td>Project management</td>
<td>Effective Communication</td>
<td>Vendor Support</td>
</tr>
<tr>
<td></td>
<td>Top mgmt. support and commitment</td>
<td>Data Accuracy</td>
<td>Data Accuracy</td>
<td>Monitoring &amp; Eval. of performance</td>
<td>Data Accuracy</td>
</tr>
<tr>
<td>End User</td>
<td>Clear Goals and Objectives</td>
<td>Data Accuracy</td>
<td>Clear Goals and Objectives</td>
<td>Education and Training</td>
<td>Top mgmt. support and commitment</td>
</tr>
<tr>
<td></td>
<td>Implementation Team</td>
<td>Education and Training</td>
<td>Education and Training</td>
<td>Effective Communication</td>
<td>Project management</td>
</tr>
<tr>
<td></td>
<td>Top mgmt. support and commitment</td>
<td>Vendor Support</td>
<td>Effective Communication</td>
<td>Monitoring &amp; Eval. of performance</td>
<td>Effective Communication</td>
</tr>
</tbody>
</table>

**Illustration 27: Perceptions of different stakeholders at each phases of implementation process (Primary Data)**

The illustration 27 shows the difference in perspective of the various stakeholders’ namely top management, middle management and end users in different organizations at each phase of an ERP implementation process.

In the project preparation phase which mostly involves identification of leadership team, project team, project planning and assignment of responsibilities the people in the top management consider factors like project management and project champion to be the most critical ones. In
this planning phase the people in the middle management would always want the support of top management to make important decisions and any change management if required. Whereas the end users would want to be clear about the goals and objectives at an early stage. In the following phases where the correct ERP package needs to be selected to meet the organizational needs and the technical codes need to be created the top management wants complete vendor support and if any changes are required to be made in the current processes before getting into the crucial stages of implementation. In these phases the middle management is more concerned about accurate data and effective communication along with proper management of the project at these middle stages. Whereas the end users are more concerned about getting the right education and training before having to use a completely new product and dealing with totally different processes.

In the next phase i.e. the final preparation phase, when the codes have already been created and testing phase has begun all the stakeholders want to make sure that the personnel performing the testing before the system goes live have proper training. The project managers and the senior managers want to constantly monitor and keep a check on the performance of the project. In the final phase when the system is handed over to the organization and all the modules go live the top management wants to constantly monitor the performance of the new system. The middle management also keeps a track of the performance and ensures that the vendor support is available constantly as the system is new and support might be needed. Whereas the end users of the system are concerned about getting full support from the top management and senior managers in case of any last minute requirements or changes that are needed to be done.

The above analysis is totally based on the understanding of the results that have been obtained from the responses of different ERP professionals. The own illustration 28 is the only source for the above analysis.

6) CONCLUSIONS
The aim of this thesis was to investigate the perceptions of different stakeholder groups towards the key factors for an ERP implementation and analyze the differences in their perceptions. This research also aimed at analyzing the difference in perceptions of stakeholders for each stage of
ERP implementation. The research was conducted by literature review, empirical data analysis and comparative analysis of literature and empirical data.

From the findings, numerous factors for ERP implementation success have been identified that are cited by different authors. Across the different research papers, some of the identified factors are repeatedly cited. Taking into consideration, the frequency of occurrence in different literatures the top twelve factors are used for this research. These factors are explained in great detail in the previous chapters. Similarly, from the literature review findings, an organization is divided into three stakeholder groups’ namely top management, middle management and end-users. An analysis has been made in this research to find the relationship between key factors and stakeholder groups of ERP implementation. The result of this thesis showed that the perspective of top and middle management is quiet similar whereas the perspective of end users is very contrasting when compared with the previous two groups. Comparative study also revealed that most of the findings of empirical data analysis are in consonance with the researcher’s viewpoint except few exceptions.

From findings of this research, critical success factors are also analyzed for different stages of ERP implementation according to stakeholder’s perception. The results revealed that the perceptions of stakeholders about the key factors change when stages are taken into consideration.

**Difference in Perspective of critical stakeholders about the Key factors**

After conducting thorough analysis it can be said that Top Management only considers those factors critical which are important at a very high level of the hierarchy in the organization and does not have much involvement of end users. The top management ignores factors like user training, data accuracy and implementation team for a successful implementation which are most essential for employees working at a lower level in the organizational hierarchy. It is also seen that most of the factors have similar rating for top management and middle management whereas the rating given by the end users is very contrasting. The possible explanation to such behavior can be that the top and middle management are closer to each other and perhaps have effective communication among them but the end users are left out and the critical information does not always reach the end user. This results into a communication gap between the managers and end users.
users. This is also the reason as to why end users consider effective communication factor more critical than the other two groups.

The most important factors according to the top management are Top Management Support and Commitment, Organizational Change Management, Project management and Project Champion. According to the middle management the most critical factors are Top Management Support and Commitment, Project Management, Effective Communication and Clear Goals and Objectives. On the other hand for end users the important factors are Education and Training, Clear Goals and Objectives, Data Accuracy, Effective Communication and Implementation Team. BPR is the least important and Clear Goals and Objectives is considered the most important by all three stakeholder groups.

**Comparison of primary and secondary data**

The objective of this thesis pertaining to comparison and analysis of the professional’s perception with previous researcher’s findings helped to identify the gaps in the perceptions of these groups. The research shows the perceptions of top management and middle management according to professionals is somewhat similar to the researcher’s findings. However, few exceptions have been revealed which points towards some deviation between the two groups. Importance of factors such as project champion, top management support, project management and implementation team is clearly stressed by literature and empirical data. Research reveals two important exceptions in this group. Firstly, need for change management is more stressed by professionals rather than researchers. This could probably be due to professionals firsthand experience of changes required for effective and efficient change management in the organization during ERP implementation. Secondly, importance of clear goals and objective is again emphasized more by professionals than researchers. The explanation for such perception can again be traced back to their firsthand experience of implementation.

Study shows that middle management also rates clear goals and objective and monitoring and evaluation of performance higher than researchers. But for other factors, professionals agree with the research findings. Top management support, project management, change management, education and training are graded as important by both the groups for successful ERP
implementation. Similarly, vendor support and business process re-engineering are on the lowest preference for middle as well as for top management.

Unlike above two comparisons, end-users perception of professionals could not be compared very critically with researcher’s viewpoint. The reason was availability of very few articles containing rating of CSFs by end-users.

Now, since implementation processes are of long durations so to check if the perceptions of these stakeholders are same for the entire process, we analyzed their perceptions at each stage of the process as well. The categorization of the process in stages revealed that there do exist different perceptions at different stages for each group.

**Perceptions of different stakeholders at each phase of ERP Implementation**

The analysis of the perspectives of different stakeholder groups for each stage of an ERP implementation process resulted in a few interesting results. In the first phase i.e. the project planning phase it was observed that two factors out the three for each stake holder group were similar to the most important factors according to each group when stages were not considered. Similarly, clear goals and objective which was an important factor according to all stakeholders when stages were not considered was again common among all three stakeholders at the first stage. In the business blueprint phase BPR and vendor support which were the least preferred factors when stages were not considered, they were the most preferred in this second phase. This shows that the opinions of professionals change when asked about the critical factors according to each stage. In the third phase, we can see that even the top management considers education and training as critical which was the least preferred factor by the same group when stages were not considered. Another point to note here is that in both the second and third phase the views of top and middle management are totally different whereas they were quiet similar when stages were not considered. In the final preparation phase education and training is considered important by all three groups of stakeholders. In the end when the system goes live monitoring and evaluation of performance is considered crucial by both top and middle management.

**Recommendations for ERP practitioners**
Through our research some imp suggestions can be made for practitioners that would positively impact the ERP implementation process. Since a significant gap exists between the perceptions of end users and top management, top management should take constructive steps to minimize these gaps. Activities such as regular meetings, interactive sessions with end users, timely communication using different channels like e-mails, informative presentations etc should be used effectively for informing the end-users about the ongoing implementation process. These efforts of top management of informing the end users about the process at regular intervals would help end users consider themselves as a part of the project and not just merely spectators watching implementation process.

Since it is the managers who are in frequent contact with the end users and top management, middle management should act as a channel for smooth flow of information between the other two groups. For effectively carrying out the top management activities, middle managers should play an integral role by organizing and conducting the activities on top management’s behalf. Also, feedbacks and grievances of end users should be conveyed by the middle management to the top management effectively so that these issues can be sorted during the process and not left to be solved at the end.

These recommendations would help in minimizing end user grievances, improve cooperation, build trust and consensus for a smooth implementation process.

7) RECOMMENDATIONS FOR FUTURE RESEARCH

As this thesis is focusing on the key factors according to different stakeholders in an organization, the area of research one step ahead of this would be undertaking comparative study involving different organizations and figure out the success rate of ERP implementations based on these factors.

Another suggestion for future research would be studying the relative importance of these factors across the different geographies or across different sectors like public and private sector. This would help in bringing the global perspective in place. And such a research would be extremely helpful for ERP consultants and organizations (seeking ERP implementation) to improve the implementation process by using the experience of other organizations in their geographies.
Apart from focusing on a comparative study in different sectors the focus could also be kept on a particular industry and organizations from only that industry could be studied, e.g. manufacturing, retail and telecom sector.

Also, an interesting area for future research could be studying the perceptions of different stakeholders for different types of implementation strategies such as rapid implementation, big-bang implementation, and phased rollout implementation. This type of research would be useful for ERP vendors to help their clients make informed decisions about selecting a particular implementation strategy for their ERP systems and reduce the risk of implementation failures due to selection of wrong strategy.
APPENDIX 1

Questionnaire

This questionnaire will serve as an input for a thesis on “Perspective of different stakeholders for a successful ERP implementation: A comparative study”. This research is being performed in Mälardalen University, Sweden by two students; Nishant Khullar and Amir Ala Moayeri under the supervision of Dr. Ole Liljefors. We would be highly obliged if you could spare 10 minutes of your valuable time to fill this survey, it would be of great help to us.

- Name:
- Designation:
- Name of your organization:
- Industrial sector your organization belongs to:
- Enterprise system (ERP) that your company is using currently:
- Number of ERP modules that have been implemented:
- Planned duration for ERP implementation (in months):
- Actual duration for ERP implementation (in months):
- Are you satisfied with the ERP implementation (Yes/No) If not, kindly specify:
Part A

Below are the factors that according to our research are critical for a successful ERP implementation. Please select one of the five options below which you think justifies the criticality of each factor for a successful ERP implementation.

1. Neither critical nor important for success
2. Important but not critical/necessary for success
3. Somewhat critical and important for success
4. Critical and important for success
5. Extremely critical and important for success

1. **Top Management Support and commitment** involves setting up new goals, objectives, vision and direction, selection of ERP package, allocation of resources and support cost demands of implementation process

   1  2  3  4  5
   □ □ □  □  □

2. **Organizational Change Management** refers to handling of changes brought about by ERP that affects people, organization and culture.

   1  2  3  4  5
   □ □ □  □  □

3. **Project Management** involves planning and allocation of responsibilities of various team members and manages milestones, critical path and timeliness of the project.

   1  2  3  4  5
   □ □ □  □  □
4. **Education and Training** refers to imparting knowledge about the benefits and usage of ERP system to make end-users familiar with the new technology

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5. **Implementation Team** should be selected for reputed people with top notch skills, past accomplishments and flexibility

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6. **Clear Goals and Objectives** should be set for better vision and planning of implementation process to achieve tangible benefits, satisfy customers and empower employees

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7. **Business Process Reengineering** To achieve the best advantage of ERP system it is necessary that organization align the business to fit the ERP system with minimal customization

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8. **Vendor Support** refers to long term commitment between the vendors and customers since there are always new modules and versions that fit better for the organization

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9. **Effective Communication** includes designing of a comprehensive communication plan to overcome any kind of miscommunication

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10. **Project Champion** A person with successful accomplishment who is accountable and trustworthy should be placed as the project leader

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11. Monitoring and evaluation of performance Evaluation should show how the system is performing and should be measured against the project goals

1 2 3 4 5

12. Data Accuracy refers to accurate and correct data entry as ERP systems integrate the information of an entire organization

Please mention any other factor here that you think is important for a successful ERP implementation:

Part B

Below are the 5 phases in an ERP implementation lifecycle. Please select the top 3 factors according to their level of importance at each stage for a successful ERP implementation.

13. Project Preparation: Planning phase of the process which involves identification of leadership team, project team, complete project layout/plan for planning the implementation and assignment of responsibilities.

- Top Management Support
- Organizational Change Management
- Project Management
- Education and Training
- Implementation Team
- Clear Goals and Objectives
- Business Process Reengineering
- Vendor Support
- Effective Communication
- Project Champion
- Monitoring and evaluation of performance
- Data accuracy, Reliability

14. Business Blueprint: Selecting of the ERP package that meets the requirements of an organization

- Top Management Support
- Organizational Change Management
- Project Management
- Education and Training
- Implementation Team
- Clear Goals and Objectives
- Business Process Reengineering
- Vendor Support
- Effective Communication
- Project Champion
- Monitoring and evaluation of performance
- Data accuracy, Reliability
15. **Realization**: Technical codes need to be created at this stage for transforming the functional requirements to technical specifications

- Top Management Support
- Project Management
- Implementation Team
- Business Process Reengineering
- Effective Communication
- Monitoring and evaluation of performance

- Organizational Change Management
- Education and Training
- Clear Goals and Objectives
- Vendor Support
- Project Champion
- Data accuracy, Reliability

16. **Final Preparation**: The testing phase of the process

- Top Management Support
- Project Management
- Implementation Team
- Business Process Reengineering
- Effective Communication
- Monitoring and evaluation of performance

- Organizational Change Management
- Education and Training
- Clear Goals and Objectives
- Vendor Support
- Project Champion
- Data accuracy, Reliability

17. **Go Live and Support**: ERP system is handed over to the organization and ERP modules go live for carrying business activities

- Top Management Support
- Project Management
- Implementation Team
- Business Process Reengineering
- Effective Communication
- Monitoring and evaluation of performance

- Organizational Change Management
- Education and Training
- Clear Goals and Objectives
- Vendor Support
- Project Champion
- Data accuracy, Reliability
REFERENCES


Lim, T.K.E., Pan, S.L. and Tan, C.W., 2005. Managing user acceptance towards enterprise resource planning (ERP) systems –understanding the dissonance between user expectations and managerial policies. European Journal of Information Systems 14, 135-149


