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ERP IMPLEMENTATION IN SMES

Consultant – Client Views On Critical Success Factors

Master´s Thesis
in Information System Sciences

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Table of contents

List of tables

List of figures

List of abbreviations

ERP:	Enterprise Resource Planning
SME:	Small and Medium Enterprise
CSF:	Critical Success Factors
BRM:	Barkat Rice Mills
TMRC:	Tariq Mustafa Ramzan Consultants
CIO:	Chief Information Officer
BPR:	Business Process Reengineering

1 INTRODUCTION

1.1 Research background

ERP system has attracted the SME market wonderfully after it achieved maturity in large enterprises. ERP vendors now consider large enterprise market as saturated and this factor has compelled them to develop their space in SMEs (Doom, Milis, Poelmans & Bloemen 2010). Other possible factor is the successful integration of large enterprises by ERP system has made its way to serve the SMEs in same regard. The potential benefits perceived by SMEs because of ERP implementation have accelerated their popularity in this market at a very good pace (Malhotra & Temponi 2010).

The above described two studies have highlighted the trend of ERP from large enterprises towards SMEs but same time the researchers have indicated certain factors that matter in success of the system. There are many known cases in which ERP implementation failed to deliver the promised results and even caused bankruptcy but 70% of the ERP projects proved successful (Doom et al. 2010). There are certain critical success factors in implementation of an ERP system in SMEs that bring success or failure. Companies that handle these issues effectively have a higher probability of successful integration of ERP system. In this regard CSF framework has proved it as an effective tool to retain the right direction of ERP system implementation and integration (Snider, Silveira & Balakrishnan 2009).

Different researchers have analyzed and tested the success factors with various dimensions. Many of them have tried to link the CSFs with various stages of the implementation process. A few of them attempted to give each CSF a hierarchy value to know that which CSF is more important and which one is less. The common future research opportunities identified by all these scholars are convincing to conduct an in-depth analysis from some unidentified dimensions for example CSFs analysis from the point of view of both entities the implementation consultant and the acquiring organization.

1.2 Research motivation

Being a former ERP system implementation consultant the author took this study as an opportunity to work in his area of interest. The study was conducted as an integral part of an international masters programme GITM (Global Information Technology Management) at Turku School of Economics (Finland). The interest was developed from previous professional studies MBIT (Masters in Business and Information Technology)

at University of the Punjab (Pakistan) and continued to the current academic engagements. The author considers himself familiar with this unexplored area of ERP in SMEs and also acquired a good knowledge about resource planning of the rice mill taken under study.

Researchers have explored the area of ERP, CSFs and SMEs very well. A lot of work is already done in identification of CSFs in implementation of ERP system in SMEs. This identification of CSFs is done from various perspectives and dimensions but the consultant – client views are not adequately explored, which the author tried to address in this study. Author tried to know the opinions of ERP consultants and clients and to make a comparison of their point of views, as this work found missing in the literature. This opportunity motivated the author to contribute in the fulfillment of this research gap. Author provided more about the motivation in next sub chapter of research problem.

1.3 Research problem

The main research question is "What are the critical success factors in implementation of ERP system in SMEs in opinion of ERP consultants and acquiring organizations?". It is divided into following further sub-questions:

Table 1: Sub research questions

Sub research questions	Way to address
1. What are the CSFs in implementation of ERP in SMEs?	By literature review
2. What are the CSFs in opinion of ERP consultant?	By interview (data collection)
3. What are the CSFs in opinion of ERP acquiring SMEs?	By interview (data collection)
4. What are the common CSFs (most important CSFs) and why?	Analysis and results
5. What are the distinguished CSFs and why?	Analysis and results

Author attempted to answer the main question from two different dimensions. Two parties are involved in this study, one is the ERP consultant company which is usually

hired for implementation. The other is the IT department of organization that is going to acquire ERP system. It is expected that the answers will be different from both the parties, because each party perceives each critical success factor from a different point of view. One CSF which is highly important in opinion of consultant may not be in opinion of client. At the end of the study two different lists of CSFs will be established that will give a better understanding to the ERP managers of SMEs.

After a comprehensive review of the literature author found this problem area unexplored that usually an SME faces shortage of human capital and prefers to hire a consultant for ERP implementation. Most of the researchers focused only on the organization that acquires ERP. A lot of research work is done in the context of CSFs, SMEs and ERP implementation but only from the point of view of acquiring organization. Some authors have tried to relate the CSFs with the stages of ERP implementation process in SMEs but they also taken it only from the perspective of acquiring organization. They did not include the opinion of consultant in their study. While the inclusion of consultant opinion can increase the accuracy of their CSFs relationship with process stages.

Another group of researchers explored the CSFs in implementation of ERP with respect to the size of the organization. They tried to categorize the CSFs with respect to large enterprises, medium enterprises and small enterprises but same omission found here, the CSFs are identified by studying the host firm only. While the consultants play important role in ERP implementation of all these three different sized organization and their role must be explored and evaluated by the researchers. Researchers think that the size of the organization matters in ERP but this study claims that the opinion of ERP consultant also matters and should not be ignored.

Beside the above discussed research trends the author found a lot of ERP research work where the ERP consultants were completely ignored. Therefore in this study it is decided to consider the opinions of both ends. The ERP host organization and its behavior must be evaluated on some scale as well as the role of ERP consultant must be explored. In order to fulfill this research gap the author fully tried to consider the opinion of ERP consultant. It is very renowned to develop a CSF framework about ERP implementation in SMEs but the forthcoming trend is to connect it with various important structural dimensions of an SME. One sub question of the study is “which CSF is more important and needs more attention”. The answer of which will constitute a ranking of CSFs. The top most factors in the both lists will be stating their top most importance. The objectives of an ERP implementation consultant vary from the objectives of ERP acquiring organization. This fact has provided a base to this study.

1.4 Research boundaries

The very first limit is the size of organization. In adopting an ERP to implement in the organization, the size of the organization matters in various important aspects (Laukkanen, Sarpola & Hallikainen 2007). The focused are small and medium sized enterprise. Ordinarily, a SME contains up to 250 employees. The resources for an SME are limited as compare to large enterprise. This study will mainly focus on the SMEs and their links with ERP implementation. This research is applicable to SME cases where the ERP system is implemented by an external consultant. The focus of the study is strictly towards ERP package the research results may not be properly fit for other ordinary information systems and their implementation.

Critical success factors are also describing a boundary wall for this study. The author will try not to go beyond the promised area of identifying critical success factors but the study will slightly touch other ERP related phenomenon, for instance the overview of ERP implementation processes stages, major costs and benefits of the system and feasibility study. But the main targets of the research are two CSF lists. The study is looking for the opinions of two parties. One is the ERP consultant what he thinks about CSFs in implementation of ERP in SMEs ?. The other is acquiring organization and his responsible staff for IT matters. What they perceive about CSFs while implementation of ERP system in their SME organization?.

1.5 Thesis structure

After introducing the topic and getting the reader familiar with the context of the thesis the next coming chapter is literature review. In this research a comprehensive literature review has a high significance because a base CSF list will be setup from literature. The study will try to dig most of the available CSF related scientific material in order to obtain common CSFs, up to this stage the theoretical background will be complete. In the next phase research process and methodology will be explained in detail, this chapter will address the process of evidence collection. The study will present the explanation of obtained evidences from all dimensions.

In the final part of the thesis, the collected material will be processed and analyzed to obtain the results. The results will be discussed and compared with the promised objectives. Then conclusion of the discussion and future research opportunities will be presented with courtesy.

1.6 Key definitions, concepts and terminologies

First key term used in this study is enterprise resource planning system. ERP system is a single but comprehensive software package consists of different modules e.g. sales, CRM, marketing, finance and accounts etc enables management to manage the organizational resources effectively. The record of whole organization is maintained by ERP system in a single central database, from where it generates the reports in order to present the organizational standing to top and middle management.

Next is a concept of critical success factors, these are the factors that influence the implementation of ERP system in an SME organization e.g. top management support, project management and communication etc. These factors critically define the success or failure of a system. These areas demand a high level of concentration in every stage of implementation process.

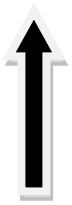
ERP consultants are the certified professionals who resell and implement the ERP system in an organization. The ERP acquiring organization is the organization that purchase an ERP system from vendor's certified ERP consultant. The ERP consultant and acquiring firm enter into an agreement in which the consultant considers responsible to successfully implement the system in the organization.

2 THEORATICAL BACKGROUND

2.1 Background of ERP

ERP system was introduced in market in the beginning of 1990s, and the target market was the large business organizations. Most organizations designed, developed and implemented centralized computing systems. After 2000 the extended form of ERP evolved, in which the foundation functionalities of ERP system increased as finance module, distribution, manufacturing, human resources and payroll to customer relationship management, supply chain management, salesforce automation and Internet-enabled integrated e-commerce and e-business. (Rashid 2005)

Table 2: ERP Evolution (Rashid 2005)



2000s	Extended ERP
1990s	**Enterprise Resource Planning (ERP)**
1980s	**Manufacturing Resources Planning (MRP II)**
1970s	**Material Requirement Planning (MRP)**
1960s	**Inventory Control (IC) Packages**

ERP system has shown a relatively high failure rate in past, it was reported that three-quarters of ERP projects were judged to be unsuccessful by the ERP implementing firms also these failures were less extensively documented. About 90% of ERP implementations are late or over budgeted and the success rate of ERP systems implementation is only about 33% (Colmenares & Otieno 2005). In the history of ERP system there are so many cases in which this system failed to deliver the promised functionality, in 2004 the famous ERP failure story was HP's SAP system, in 2006 Oracle Fusion Application failures got popularity. But these failures also played important role in further innovation and advancement in this field.

ERP adoption at SMEs has been catching up, the situation has constituted a very interesting market for ERP vendors to penetrate (Everdingen, Hillegersberg & Waarts 2000). At start, the target was large organizations but with the passage of time as the more customization introduced, the application of ERP system has been successfully experimented in SMEs. Now in these days every big vendor has a specific ERP solution for SMEs.

2.2 ERP by definition

Most of the researchers talked about ERP system as a centralized information system who manages and reports about the operations of all concerned departments of the organization. They described it as an information system that consists of different modules. These modules include utilities for accounts, finance, marketing and sales, field service, product design and development, production and inventory control, procurement, distribution, industrial facilities management, process design and development, manufacturing, quality and human resources (Malhotra & Temponi 2010).

Muscatello, Small and Chen (2003, 850-871) described ERP system in a different way, they have pointed it out as a solution to a specific problem. According to them enterprise resource planning (ERP) systems are designed to address the problem of fragmentation of information in business organizations. ERP systems offer to computerize a complete business with a suite of software modules covering activities in all departments of the business. Furthermore, ERP is now being promoted as a desirable and critical link for enhancing integration between all functional areas within the manufacturing enterprise, and between the enterprise and its upstream and downstream trading partners.

After studying the definition of ERP system provided by above two authors we can conclude that an enterprise resource planning (ERP) system is a packaged business software system that enables a company to manage the efficient and effective use of resources (materials, human resources, finance, etc.) by providing a total, integrated solution according to the organization's information-processing needs.

2.3 SME Computing

SMEs are different from large organizations in many ways. SMEs have limited financial resources to spend on IT. There is a lack of highly skilled human resources, specifically SMEs lack skilled graduates. Because of these limitations of funds and personnel the SMEs have limited IT knowledge. Similarly SMEs are not able to provide professional IT trainings to their employees. The limitations like these differentiate SMEs from large enterprises (Laukkanen et al. 2007). But there are some advantages as well, that SMEs have over large enterprises e.g. SMEs have fast decision making process, the issues and problems are comparatively less complicated in SMEs. So, in this action it is tried to discuss that in which way the SMEs are different from large enterprises and how it affects the use of IT and ERP in SMEs. Also the author attempted to present the opinions of different researchers about this differentiation.

SMEs are forced to make implementation according to resource constraints and subsequently putting the success of their ERP project at risk (Sun et al. 2005). Although SMEs have advantages such as organizational simplicity but they usually face major problems in shortage of resources and funds (Ahmad & Cuenca 2013). SMEs usually face limited financial resources. The funds allocated for IT development are also limited. Large enterprises can easily collect funds from many ways e.g. by issuing stocks and bonds in different financial markets and by taking loans from different financial institutions. The financial organizations prefer to serve the large enterprises. So, large enterprises have sufficient funds to spend on IT development of the organization (Pleshko & Nickerson 2007).

These large firms can easily buy the expensive ERP softwares. These firms can arrange professional IT trainings for their staff. But on the other hand SMEs have less opportunities to arrange finance for the company. The financial organizations hesitate to provide funds to SMEs because of low profit ratio with high risk of insolvency. The financial institutions feel insecure while serving the financial needs of the SMEs. Therefore SMEs have limited finance to allocate for IT development. SMEs are very conscious while spending huge amounts on ERP and other IT related expensive matters.

The financial constraints hinder SMEs in the adoption of IT. These constraints also affect negatively on IS implementation and its success in SMEs. The IT investments in SMEs are becoming more vulnerable due to risks of failure (Laukkanen et al. 2007). After the above discussion about financial constraints it can be concluded that there is a different decision environment for SMEs and large enterprises to make their IT decisions. Large enterprises have more wide range of options and IT solutions while SMEs have limited financial resources and limited available IT solutions. The factors in success of IT will also be different in SMEs and large enterprises.

SMEs lack adequate skilled managers and workforce, because most of the university programmes target large enterprises and their requirements. Universities education focuses more on the needs of large firms while the competent managers for SMEs are produced less. This ultimately cause a lack of interest in business students towards SMEs and therefore SMEs lack competent and specialized managers for their case. SME managers lack ERP skills, understanding of SME business model and SME practices. These limitations can be covered by adopting a learning environment. This learning environment contains learning of ERP system, business simulation games and the practice enterprise model. (Nisula & Pekkola 2012).

Limited human capital for SMEs is also a consequence of limited financial resources. SMEs usually do not have sufficient funds to hire highly skilled and expensive IT professionals. These IT professionals can be in-house or from out of the organization. The in-house IT staff serves as a employee of the organization and will receive salary. The IT professionals outside the organization serve as consultants and they take consultancy

fee. These professionals suggest which technology is suitable for the company depending upon certain circumstances. The external advice in IT investments is more characterized towards small enterprises (Laukkanen et al. 2007). Large enterprises can afford these highly expensive IT professionals so in their case the decision environment for IT related matters is different than SMEs. The management of SMEs tries to reduce the ambiguity and uncertainty that causes sometime slow decision making.

SMEs and large organizations have different IT goals, objectives and management styles. Large organizations usually face highly competitive environment and react rapidly over the changes in competition. SMEs face less competition and are slow to react over changes in the competition. Small companies do not found to be more inclined towards cost reduction and efficiency improvement objectives of IT/IS adoption. Even SMEs hinder to update their technology (Laukkanen et al. 2007). Because both have different attitudes to handle the risk. Large enterprises do not hesitate to take risk and keep balance between offensive and defensive behaviors. While the SMEs wholly embrace the risk because their whole business is at risk because of less affordability.

Table 3: The three most important categories of reasons for ERP system adoption (Laukkanen, Sarpola & Hallikainen 2007).

Category	Small %	Medium %	Large %
Development of integration and business capabilities	67.6	58.6	51.5
Replacement of outdated information system	20.6	24.1	30.3
Efficiency improvement and cost reduction	11.8	17.2	18.2

The above given table 3 is the outcome of Laukkanen et al. (2007) study. The table 3 shows that small and medium enterprises are slow to replacement of outdated information system as it is 20.6 % and 24.1 % respectively. While the large enterprises are comparatively fast to replace the outdated information system and the score is 30.3%. Because the SMEs are slow to adopt new systems and technology therefore SMEs have less efficiency improvement and cost reduction. On the contrary, large enterprises are comparatively fast to adopt new systems and technology therefore they have more efficiency improvement and cost reduction.

SMEs with different size and scales of operations, the requirements and expectations from any ERP product change significantly, this difference can be in multiple factors including span of operations, process reengineering and resource availability, etc. (Saini et al. 2013). Critical success factors for the implementation of ERP in a SME environ-

ment may differ substantially from ERP implementations in large enterprises because the technological and organizational factors are substantially different in both environments (Doom at al. 2010).

The purpose to read the opinions of different researchers in this context is to know, what were the needs due to which ERP introduced in SMEs ?. Because of expensiveness of the ERP system first of all it was popular in just large scale organizations , but now it has gain popularity in small and medium enterprises as well. Because of globalization in SMEs and the increase in competition in small and medium enterprises they feel the need of ERP and then a space is created to be occupied by ERP

This is in line with the opinion of Rao (2000, 81) opening up of the economy, small to medium sized enterprises (SMEs) have found the growth very difficult. Because they do not have the robustness associated with large companies, SMEs have to grab the power of integrated resource management system to stay competitive and customer oriented. ERP is often considered the answer for the question to their survival. Therefore, the ERP software market has become one of today's larger IT investment in SMEs, world widely. The main reasons behind are:

- Now ERP is affordable by SMEs
- Domain knowledge of suppliers
- Local support
- Technical upgradable
- Incorporation of latest technologies

Shehab et al (2004, 359) says that in most of the countries, SMEs play important role in growth of the economy. In the past few years SMEs were acting on domestic markets, but today the internet based technologies and social media are changing the basis of competition between international SMEs. They are facing now global competition and feeling difficulties in continuous improvement of their competitiveness to assert themselves in the market. Therefore, SMEs are moving towards ERP packages in recent years most ERP system suppliers have increased their focus on SMEs. Because of financial restrictions SMEs cannot afford high-scope ERPs, there is a need to provide micro ERPs, i.e. near ERP capabilities built into a product and sold at an affordable price, including implementation.

2.4 CSFs in Implementation of ERP system

In this sub chapter the author will present findings from literature review related to CSFs in implementation of ERP system. The author searched following databases available at electronic library of University of Turku:

- Emerald
- Business source complete
- Science direct

with key words “ERP”, “SME” and “CSFs”, in result a number of articles found but all were neither fully related nor scientific. Author tried to select the articles from scientific journals in which researchers only talked about ERP system and its implementation in SMEs and they presented certain CSFs. The detail about these journals along with number of articles found is given in table 4.

Table 4: Frequency of articles from journals

Journal Name	**No of Articles selected**
International Journal of Production Economics	2
Journal of Enterprise Information Management	2
Journal of Manufacturing Technology Management	2
Business Process Management Journal	3
Global Journal of Flexible Systems Management	1
Journal of Modeling in Management	1
Journal of Enterprise Resource Planning Studies	1
Business and Management Review	1
Interdisciplinary journal of contemporary research in business	1
European Journal of Economics, Finance and Administrative Sciences	1
Journal of Information Technology and Economic Development	1
International Journal of Business and Management	1
International Journal of Managing Projects in Business	1
Industrial Management & Data Systems	1
Journal of Business Economics and Management	1
Operations Research & Decisions	1
International journal of production research	1
International Journal of Information Management	1
Robotics and Computer-Integrated Manufacturing	1
Expert Systems with Applications	1
International Journal of Operations & Production Management	1

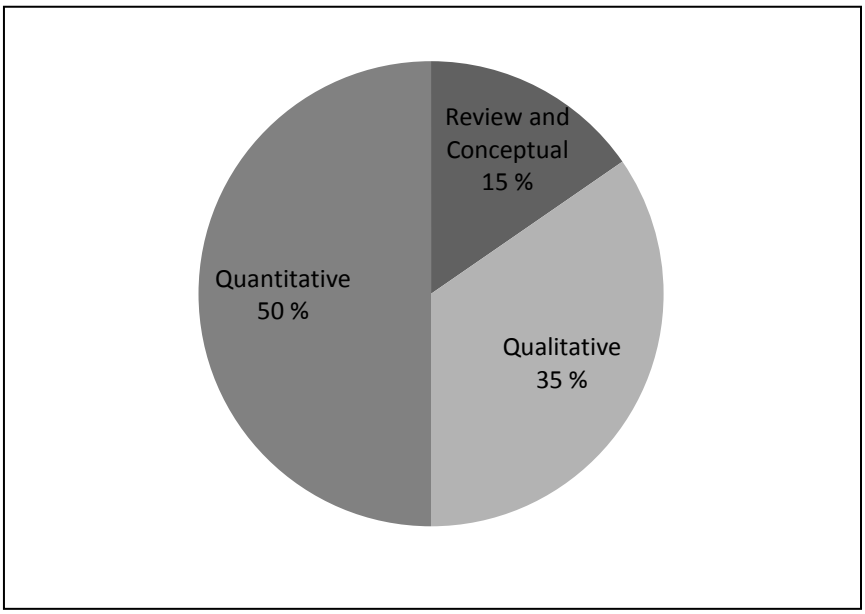


Figure 1: Ratio of research methodologies found in literature

Author has provided a summary of selected articles their titles, journals, research questions, research methodology and data collection method in form of a table which is given in appendix 1. The ratio of different research methodologies found in these articles is given in figure 1. Most of the researchers adopted quantitative survey methodology to achieve their research objectives. 35% used qualitative research methodology and only 15% used review, content analysis and conceptual methodology.

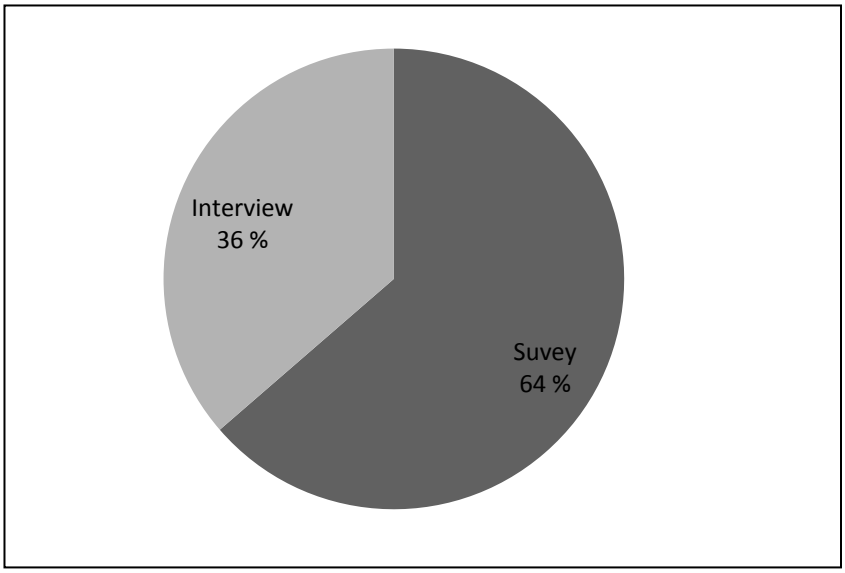


Figure 2: Ratio of data collection methods found in literature

If the 4 articles of review and conceptual methodology excluded then 64% researchers used survey method to collect data and 36% used interview technique. The number of CSFs presented in each article differs in terms of quantity e.g. some authors presented 18 CSFs and some presented only 5 but in total 45 CSFs founded. 26 articles selected to present CSFs in form of a table. In total 45 CSFs found in opinion of these researchers. The list of 14 most common CSFs will provide a ground for this study. Table given in appendix 2 presents that which author is agreed on which CSF. The first row of table given in appendix 2 presents common 45 CSFs. The first column is showing the names of authors. The symbol of number one (1) describes that this author is agreed on this CSF. The purpose is to short down the list of these 45 CSFs into 14.

Table 5. Arranged CSFs as per frequency of occurrence

Sr No.	CSFs	Frequency	Sr No.	CSFs	Frequency
1	Project management	21	**24**	Alignment of goals	2
2	Top management support	21	**25**	Clear goals and objectives	2
3	Business process reengineering	19	**26**	Knowledge management	2
4	ERP teamwork and composition	19	**27**	Minimal customization	2
5	Effective communication	17	**28**	Project competence	2
6	User training and education	17	**29**	Resource availability	2
7	Change management	14	**30**	Strong ERP product	2
8	Project champion	10	**31**	User friendliness	2
9	Qualified consultant selection	10	**32**	Compatibility with existing structure	1
10	Consultant participation	9	**33**	Data analysis	1
11	User involvement	9	**34**	Financial budget	1
12	Business plan and vision	7	**35**	Information security	1
13	Culture readiness	7	**36**	Operational process and discipline	1
14	ERP package selection	7	**37**	Organizational structure	1
15	Capability of integration	6	**38**	Pre implementation analysis	1
16	ERP implementation strategy	6	**39**	Reliability of ERP product	1
17	Performance evaluation	6	**40**	Reward system	1
18	Software development and testing	6	**41**	Risk management	1
19	Db conversion	5	**42**	Steering committee	1
20	Legacy system	5	**43**	System testing	1
21	Choosing of ERP supplier	4	**44**	Technical readiness	1
22	Departments participation	3	**45**	Transition technique	1
23	ERP implementation methodology	3			

The above table 5 presents a summary of literature review outcome. The CSFs are arranged as per their frequency of occurrence in literature. The top two CSFs are project management and top management support. Researchers consider these two CSFs as most important factors in successful implementation of ERP system in a SME organization. One purpose behind this graphical presentation of literature review was to analyze the diversity in literature. The reader can observe that the top two CSFs, although they have highest importance but still are omitted in some articles e.g. Khadija & Elmeziane (2012) and Malhotra & Temponi (2010).

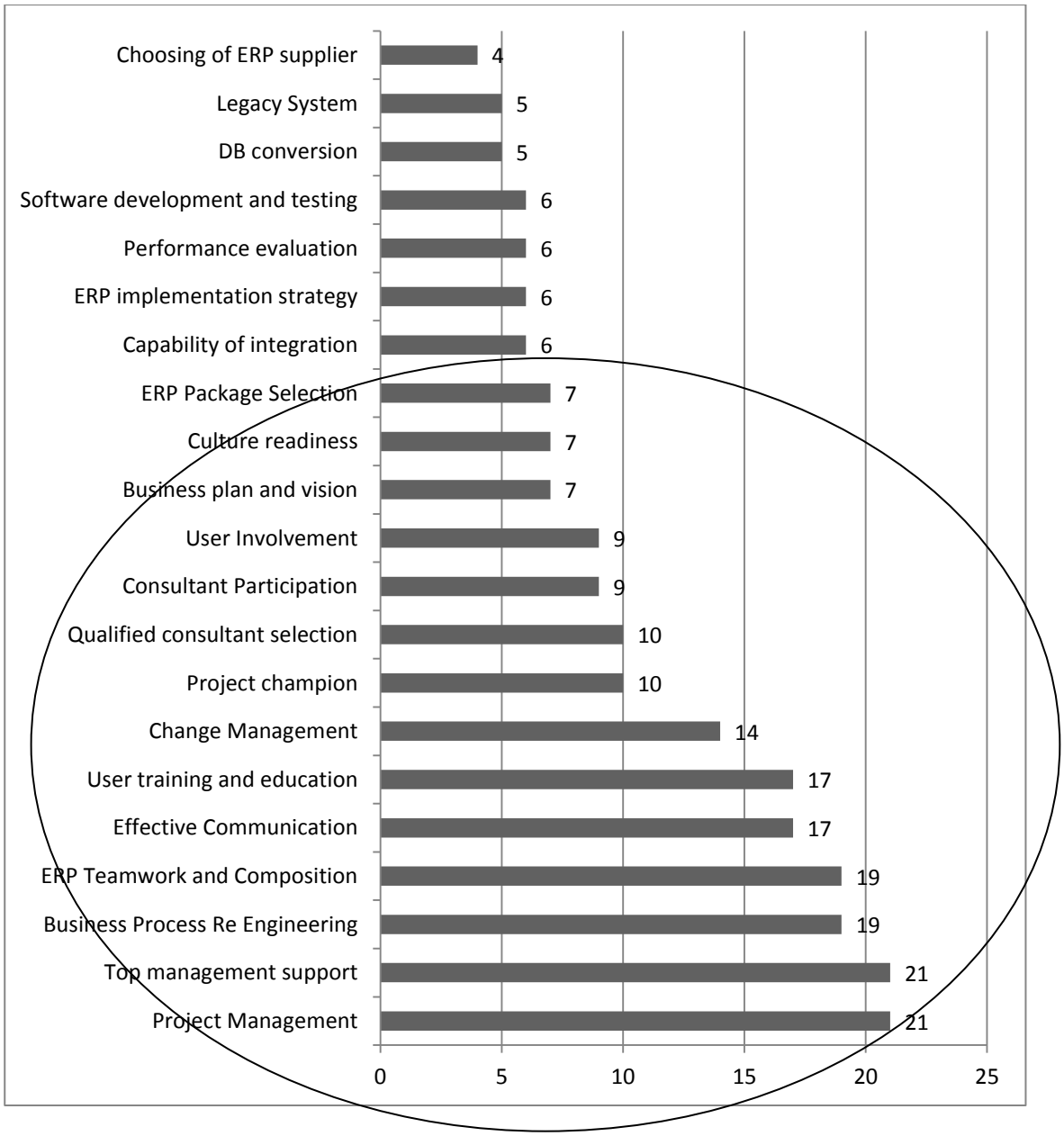


Figure 3: Comparison of CSFs and their frequencies

The figure 3 provides a summarized comparison of CSFs and their frequencies. Top management support and project management are having longest bars. While team work, BPR, user training, change management and communication are also having larger bars. The CSFs from project champion to upwards are having medium long bars. The CSFs with shortest bars are not included in the figure 3. The circle in the figure 3 is showing the selected CSFs for empirical study.

Francoise et al (2009) performed a Delphi survey with a panel of ERP experts to explore the practical activities important to manage ERP system. They are agreed on ERP teamwork and composition, BPR, top management support, project management, effective communication, culture readiness, change management, business plan and vision, project champion, performance evaluation, user involvement and knowledge management. Ahmad and Cuenca (2013) reviewed 50 articles to collect the base CSFs and they investigated their applicability to SMEs. Their research results supported knowledge management, qualified consultant selection, performance evaluation, culture readiness, effective communication, project management, top management support and commitment and ERP team composition as a important CSFs while implementing ERP in SMEs.

Loh and Koh (2004, 3433) have specifically researched the CSFs with respect to SMEs. They tried to explore critical elements for a successful enterprise resource planning implementation in small and medium sized enterprises. First they reviewed the literature and listed the findings then they conducted personal interviews with eight SMEs in the UK in order to verify the research results obtained from literature review. They first identified 21 CSFs then they deducted 11 on the base of similarities between CSFs. According to them the most important CSF is project management. There should be some responsible personnel who will account for the achievements of results with this implementation. They are also agreed on high important of top management support, effective communication, and strong ERP teamwork and composition.

Venugopal and Rao (2011) emphasized on project management, top management support and user involvement. There is a deep link between top management commitment and the operational advantages obtained from ERP system. The involvement of user in implementation process can guarantee operational success. Dezdar and Sulaiman (2009) discussed the 17 CSFs and thrown light on the importance of legacy system impact, qualified consultant selection, consultant participation, ERP package selection, performance evaluation, effective communication, project management, top management support and ERP team composition in implementation of ERP system. They investigated these CSFs from the perspective of chief information officer of the organization.

Finney and Corbett (2007, 329) have worked on ERP implementation, compilation and analysis of critical success factors. They used the literature review research methodology and in this way they reviewed 70 articles and out of which 45 considered to

contain “success factors”, by conceptual analysis of these 45 articles they reached at their compilation. The factors were divided into two different categories strategic critical success factors and tactical critical success factors. Top management commitment and support is the most important CSF according to them. They emphasized on the need to have a committed leadership. They are also agreed on project management and change management. The implementation team should be formally prepared for the change and its effects. They also discussed the aspect of managing cultural change. In this research they have talked about a communication plan specifically between business and IT personnel.

Pang-Lo-Liu (2011) explored the influence of CSFs on management performance. His study suggests the support from senior managers, corporate vision, reengineering of corporate flows and project management, selection of appropriate consulting firms and software suppliers, the identification of suitable employees to take part in ERP introduction and the proper training and education programs have positive influences on management performance. Saini et al (2013) found four out of five hypothesized factors related to the success of ERP system implementation. These are comprehensiveness of software, development/process integration plan, significance of age of IT infrastructure, comprehensiveness of data migration plan and extensiveness of system testing.

Ram, Corkindale and Wuc (2013) emphasized on conceptualization of factors associated with success of ERP systems. They developed a model by collecting evidences from 217 organizations that describes relationship between management performance improvements and CSFs. The suggested CSFs by their study are project management, business process reengineering, user training and education, performance evaluation and capability of integration.

Companies can obtain competitive advantage if the business process reengineering is effectively done in ERP system implementation stage. Business process reengineering has up to 44.20% role in successful implementation of ERP system (Hasibuan & Dantes 2012). If all CSFs are divided into three parts the first 14 are the most important CSFs that will be verified by empirical study in the next chapters. The second 15 CSFs have medium importance near to researchers e.g. database conversion, knowledge management and minimal customization etc. The last 16 are the least important CSFs as per experience of researchers e.g. reward system, risk management and transition technique etc.

1. Project management
2. Top management support
3. Business process reengineering
4. ERP teamwork and composition
5. Effective communication

6. User training and education
7. Change management
8. Project champion
9. Qualified consultant selection
10. Consultant participation
11. User involvement
12. Business plan and vision
13. Culture readiness
14. ERP package selection

The above given list of 14 CSFs is the outcome of this chapter. These are the most common CSFs identified from research work of all considered authors. These CSFs will be used as a ground to empirical study. The outcome of literature review confirms the importance of two CSFs qualified consultant selection and consultant participation near to considered researchers. These two CSFs support the research gap of this thesis. The study claims that there is not enough research conducted on CSFs in implementation of ERP system in the opinion of an ERP implementation consultant. There is a need to ask both parties that what are CSFs in their opinions. These two parties are, ERP implementation consultant and ERP acquiring organization. Then the common CSFs in the opinion of both parties should be given more importance in forthcoming implementations of ERP in order to increase the success rate.

These CSFs are presented in figure 4 in form of a pie chart that describes their frequency of occurance in literature. The figure 4 also provides an inter CSF comparison. More than half of the total area is occupied by five CSFs Project management, top mangement support, business process reengineering, ERP team work and composition and effective communication. These five CSFs are dominating the other nine CSFs.

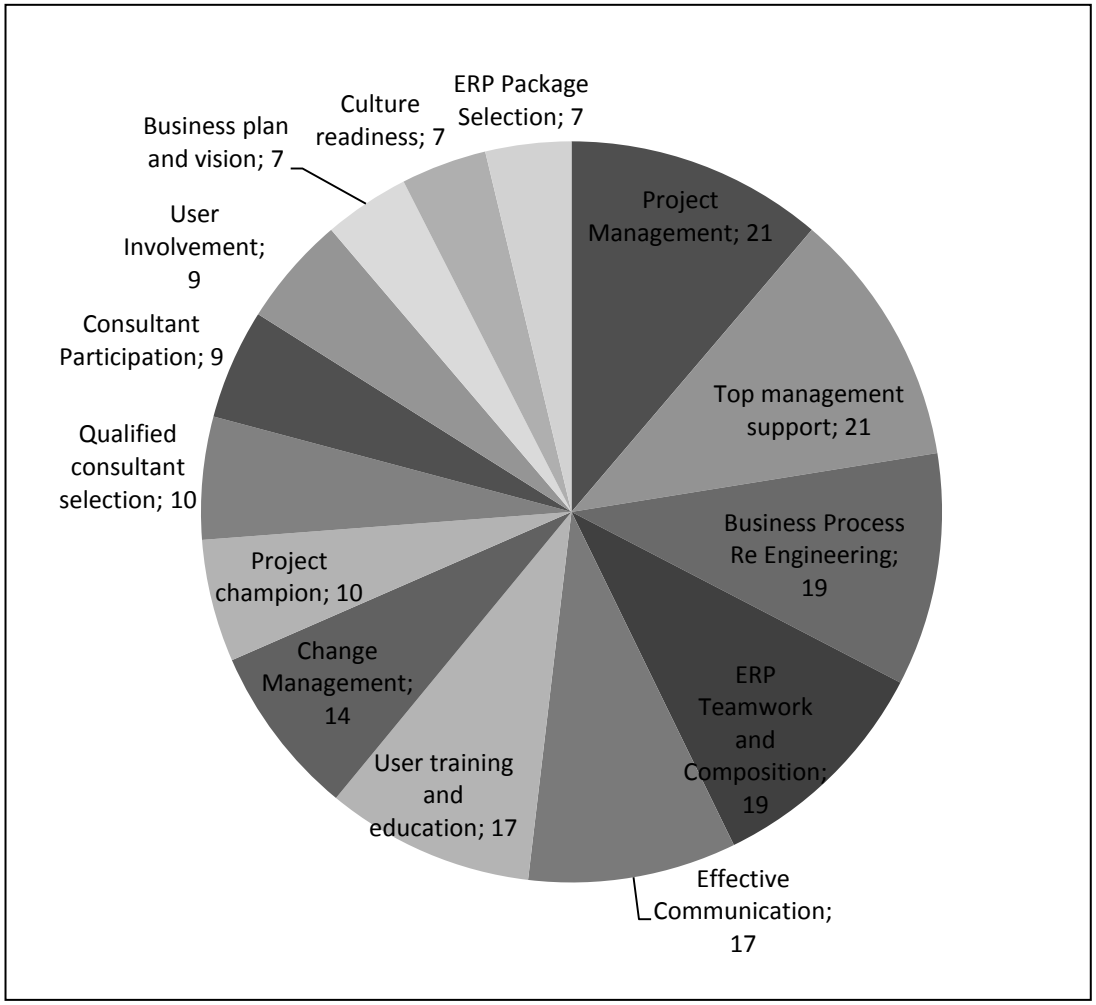


Figure 4: Comparison among the Selected 14 CSFs

3 RESEARCH PROCESS

3.1 Research methodology

Quantitative and qualitative research both have certain merits and limitations. The use of these two research approaches depends upon the different factors and nature of study. In a broad view quantitative research is used to test the hypothesis by using statistical procedures. The data is available largely and it is input into the statistical processing of data. This method is effective when the purpose of the study is to identify the general trends but it has limitation that it is not so useful when the purpose is to analyze the specific and narrow scope research objects. While qualitative research is useful when the limited group is under analyses. The data is comparatively short in amount in this type of study (Trochim 2001). The qualitative study provides an opportunity to researcher to actively involve himself with organizational process and to understand the phenomena behind comparisons and confusions (Carcary 2009).

Case study method is best fit for exploratory nature of study (Yin 2003). The case study approach is widely used in information system science research because it gives us an opportunity to make an in-depth analysis of the information system implemented in particular organization. In this approach one can analyze the internal position of a system in detail. The outcomes are valid and applicable to external cases. The general objective of the case study research method is to contribute to the development of trends. Case study is an empirical inquiry that investigates the phenomena behind some practical issues with respect to certain causing factors (Dul & Hak 2008). In this research the author has to identify the most important CSFs in implementation of ERP system in opinion of a consultant and CIO of the organization so the "identification of CSFs" also advocates for a case study research approach.

Case study research methodology is the best tool to gather the knowledge of practitioners of a particular field and organization. IS practitioners are the key persons that hold the knowledge about issues of an information system and its causes. The ability of this method to generalize the findings increases its strength in information system research field. The outcomes drawn by studying a group of organizations with similar attributes can be generalize with enough validity. Table 6 is providing the key characteristics of a case study research method. To sum up the discussion three reasons for case study as an effective research methodology in IS research: firstly, researcher can study the information system in its natural setting, secondly, it enables the researcher to find the answers of the research questions by closely understanding the complexity of the system and finally it allows the researcher to find an innovative idea to accelerate the pace of success in information system (Benbasat, Goldstein & Mead 1987).

Table 6: Key characteristics of case study approach (Benbasat et al. 1987)

1. Phenomenon is examined in a natural setting.
2. Data is collected by multiple means.
3. One or few entities (person, group, or organization) are examined.
4. The complexity of the unit is studied intensively.
5. Case studies are more suitable for the exploration, classification and hypothesis development stages of the knowledge building process; the investigator should have a receptive attitude towards exploration.
6. No experimental controls or manipulation are involved.
7. The investigator may not specify the set of independent and dependent variables in advance.
8. The results derived depend heavily on the integrative powers of the investigator.
9. Changes in site selection and data collection methods could take place as the investigator develops new hypotheses.
10. Case research is useful in the study of "why" and "how" questions because these deal with operational links to be traced over time rather than with frequency or incidence.
11. The focus is on contemporary events.

Another major reason behind the selection of case study method is the similar attributes of SMEs in Pakistan. In SME industry of Pakistan there are no huge differences in basic characteristics of the companies for example number of employees, sales volume, business area coverage, span of product line, purchase volume and assets etc these are almost same. Furthermore, the ERP systems for SMEs do not differ massively in its attributes. These systems provide almost same functions and facilities to all SMEs. The environment of implementation is also almost same. There are less chances that the CSFs identified from ERP of one SME will differ from other. Therefore studying one SME and its information system provides enough evidence to generalize the results at country level.

A minor reason to choose case study is limited availability of data in this particular case. A very limited research is conducted in SMEs in Pakistan in field of information system. One significant reason is non-cooperative attitude of the managers other is limited availability of ERP experts in Pakistan. There are only few certified ERP experts in Pakistan and it is very hard to find them to obtain their opinions. The study aims to col-

lect data from Pakistan but there are also not enough consultants available to implement ERP system in SMEs. In such situation the only case study method was a way to analyze the problems and their causes. Therefore, only one consultant is selected and one organization is taken as a case to study. One face to face semi structured interview with CIO of the SME company that acquired ERP system and one semi structured interview with implementation consultant will give a more clear idea about the exact CSFs. A case study approach gives more inner view of causes behind the problems faced by an organization.

3.2 Case study

3.2.1 "BRM" as an ERP acquiring SME

Barkat Rice Mills is a SME company incorporated in Pakistan under Pakistan Companies Ordinance 1984. The reason to select BRM is the recently implementation of ERP system in organization by a Microsoft certified consultant firm TMRC. BRM is one of the major profit earning companies among rice export industry. The IT staff of BRM founded cooperative educated and well trained. The main area of business is rice processing and export. The rice is exported globally but mainly in Europe. One brand of Barkat Rice Mills with the name "KAALAR Super Basmati Rice" can be found in Sweden and Finland too. The company has 100 full time working employees. CIO of the company is responsible for all IT related functions and tasks of the organization. In Feb 2012 the top management of BRM decided to implement ERP system Microsoft GP dynamics 10.0 in their organization and for this they contracted with TMR Consulting (pvt.) Limited.

A central management system was required by BRM that links all departments together. The system should enable top management of the organization to see the business position in single view. BRM management demanded reports on the progress of the company as whole and on the progress of each department individually. Microsoft GP dynamics considered as one of the pretty good solutions for them. As it is especially designed for SMEs by Microsoft. Microsoft claims it as "It works the way you want". It is easy to use. It automates and connects the full range of financial management, manufacturing, supply chain management, human resource and payroll management.

Top management of the BRM compiled an ERP team to work with consultant team in order to implement the system effectively. The representatives included from all departments accounts, sales, store, finance, marketing, supply chain management, human resource and IT. The persons from IT department in ERP team were CIO, the database

administrator and support officer. They were responsible for two tasks one is to communicate the requirements of their company or department accurately and completely to the consultant team and the other is to get appropriate training of software from the consultant team. If they feel they are not satisfied with the working of the system, or it should be done in other way to produce accurate results, they must inform the implementers on time. The customization of the system was done by consultant team with respect to BRM requirements under the supervision of this ERP team.

3.2.2 "TMR Consulting" as an ERP consultant

Tariq Mustafa Ramzan & Co is one of the very well reputed ERP consultancy organizations in Pakistani market. They are not operating in Pakistan only but also they have clients in GULF states. TMRC is a Microsoft gold certified partner firm in Pakistan that provides consultancy services in implementation of ERP system. TMRC provides the ERP solutions of the Microsoft to both SME market and large enterprise market. For SMEs they suggest Microsoft GP dynamics and for large enterprises they suggest Microsoft Axapta. They recently implemented Microsoft GP dynamics in Barkat Rice Mills. They resell the software package to their clients. In the contract between TMRC and BRM the charges for software license and consultancy fee both included. TMRC have implemented the following modules of GP dynamics in BRM.

- General Ledger,
- Fixed Assets Management,
- Receivables Management,
- Sales
- Supply chain management
- Financial reporting
- Payables Management,
- Manufacturing
- Inventory Control,
- Human Resource & Payroll Management

TMRC designed an ERP implementation team for the BRM GP dynamics project. The team leader was a director of the company himself. The responsibility of this consultant team was to fully coordinate with BRM ERP team and to obtain the demands of the all departments and the company accurately. After getting the business needs of each department the team was responsible for the customization of the system and then its implementation in the planned way. Then next task was the installation of the report-

ing module that will show the reports to top management about the position and progress of each department and then the position and progress of the whole organization. The consultant team was having a specific role to train the staff of the BRM. ERP consultant team was responsible to perform "train the trainers session" with BRM ERP team. Then BRM ERP team will train the other employees of the organization.

3.3 Data collection

In qualitative research when the target is to explore the causes behind issues and there is lack of theory available the suitable data collection technique is semi structured interviews of the knowledge brains (Fisher 2010). In semi structured interview generally two types of questions are asked, one is open ended and other is close ended, so it is like a mix of both. The questions used in questionnaire are asking first about the positive or negative response which is "yes" or "no", then the reason is asked which is an open ended question. In this study as per limited availability of the resources, the two persons selected for semi structured interviews. It is attempted to give equal representation to both of the parties involved in study, the ERP consultant and the ERP acquiring organization. The sample is selected with bias because the target of the participant selection was to choose the brains with highest knowledge of the field.

Author prepared a questionnaire to conduct interview is available in appendix 3. The questionnaire sent to interviewees one month prior to date of interview. The questionnaire contains questions with two parts. First part of the question is investigating whether the respondent is agreed on high importance on this CSF or not. Second part of the question is asking the opinion of respondent that why they are agreed or not agreed on high importance of this CSF. The answers were expected as related to the case of ERP implementation in BRM. The author in this questionnaire attempted to investigate the highly important CSFs in opinions of ERP consultant and CIO of BRM while implementing the dynamics GP in BRM. The close ended question was used to reduce the confusion. Author wanted to has clear idea that whether respondent agreed or not. Then open ended question helped to find the cause of the problem.

Before the interview, in preliminary discussion with interviewee, the author provided a brief explanation over these 14 CSFs about which the questions are asked. This helped to provide a clear understanding to interviewee about the definition of each CSF and in what way the interviewer is considering it. Author explained them how he collected these 14 CSF from literature and what is the purpose of this study. This discussion helped to increase the accuracy of the answers from interviewee.

3.3.1 Data collection from BRM

The person selected for interview from Barkat Rice Mills is the CIO of the company. He completely motiored the process of GP dynamics implementation in the all departments of the company. The reason to select him is his high involvement in ERP implementation. He served as a head of the ERP team from BRM.In the preliminary discussion with CIO before the interview, he explained the process of ERP implementation in BRM briefly. He explained the problems he faced during this project and how he handled it and achieved success in this project. The attitude of the respondent shown that the company is pretty stisfied from the implemented system and its working.

Author asked CIO about his opinion, whether he agrees or not on high importance of these 14 CSFs in implementation of dynamics GP in BRM. Furthermore, CIO is asked to explain the reasons that why he is agreed or not.The summary of response from CIO is provided in both tables 7 and 8. There were total 9 CSFs upon which the CIO said ”Yes” and 5 CSFs upon which he said ”No”. The reasons provided in the both tables are the summarized statements with almost same words.

Table 7: CSFs with response ”YES” from CIO alongwith reasons

Sr. No.	**CSF**	**Response of CIO**	**Reason**
1	Project management	YES	Project success is based on a comprehensive and complete project plan
2	Top management support	YES	ERP is a matter of whole company and CIO has limited authority. so it demands involvement of all top level managers and stakeholders
3	ERP teamwork and composition	YES	The key employees of client need proper involvement in the implementation process to learn about the inner issues.
4	Effective communication	YES	It is necessary to arrange meetings at every stage of the project to communicate about the progress and shortcomings.
5	User training and education	YES	Definitely the training is life blood of success, our employees must be properly trained in all matters.
6	Change management	YES	Yes the change should be managed adequately, it should be break down in some stages, otherwise our employees will hesitate to accept it.
7	Project champion	YES	Yes there must be a person with passion and full devotion to make the project successful in any way.
8	Consultant participation	YES	Yes it is much critical than consultant selection. SMEs can select any consultant but the participation is mandatory from the head consultant. The activity from employees of consultant is not enough.
9	Business plan and vision	YES	Yes an IT oriented business plan is the pre requisite to derive value from ERP. In fact ERP adds value to corporate image.

Table 8: CSFs with response ”NO” from CIO alongwith reasons

Sr. No.	CSF	Response of CIO	Reason
1	Culture readiness	NO	SMEs are always ready to update. Employees also want to learn new technology.
2	ERP package selection	NO	All ERPs serve the same purpose.
3	Business process reengineering	NO	The business process remained same and the change in management and reporting is obvious but not critical
4	Qualified consultant selection	NO	Usually every consultant is qualified and every ERP package serves the same purpose.
5	User involvement	NO	The end users typically not involved that much, because they just need to know the use of software.

3.3.2 Data collection from TMRC

The person selected for interview from ERP consultant side is the Director of TMRC who acted as a ERP consultant for BRM. He was full in charge and served as a head of the implementation team from TMRC side. He is a Microsoft Dynamics Certified Technology Specialist. He has implemented ERP and accounting softwares in more than 300 hundred organizations. He was responsible for successful working of the software package as aligned with the business process of BRM. All the technical decisions were taken by him.

Author asked consultant about his opinion, whether he agrees on each of these 14 CSFs in implementation of dynamics GP in BRM. Furthermore, he is asked to explain the reason that why he is agreed or not. The questions were same for CIO and the consultant but answers founded different.The summary of response from consultant is provided in both tables 9 and 10. There were total 7 CSFs upon which the consultant said ”Yes” and 7 CSFs upon which he said ”No”. The reasons provided in the both tables are the summarized statements with almost same words.

Table 9: CSFs with response ”YES” from consultant alongwith reasons

Sr. No.	CSF	Response of ERP Consultant	Reason
1	Project management	YES	If project manager fails to perform his role the project success is impossible
2	Top management support	YES	If management is not supportive it also causes the non-attention of consultant to the project.
3	Business process reengineering	YES	Yes we need to know exactly what the client wants to change and how we will change it
4	ERP teamwork and composition	YES	Yes it is not a work of individual, better team members from both side can produce better results
5	User training and education	YES	Yes if the users are not trained well by the trainers then the project will be fruitless
6	Qualified consultant selection	YES	Yes for SMEs it is critically important to select a qualified consultant because if consultant lacks knowledge then who will solve the issues.
7	Consultant participation	YES	Mostly consultants work on more than one project and do not participate properly in all projects, it is important to ensure the proper participation from qualified consultant

Table 10: CSFs with response ”No” from consultant alongwith reasons

Sr. No.	CSF	Response of ERP Consultant	Reason
1	User involvement	NO	Users should be trained well, but their involvement in all stages of implementation does not matter.
2	Business plan and vision	NO	There is no significant relationship between ERP and business plan
3	Culture readiness	NO	Organizational workers must have to learn ERP by hook or by crook
4	ERP package selection	NO	If the consultant is certified then obviously he/she will recommend a good ERP. No need to worry.
5	Effective communication	NO	The communication is not critical the establishment of interest between the stakeholders is more important.
6	Change management	NO	Not that much critical it is covered under BPR
7	Project champion	NO	No. the project manager is important only.

3.4 Data Analysis

First of all the responses of the both participants studied deeply in raw form. Then the raw data is tabulated with respect to opinion of each respondent. In this way the author got two lists showing the answers of each interviewee. The answers were coded into two terms “yes (agree)” and “no(not agree)”. The lists which are showing the CSFs upon which author agreed have been presented previously in the data collection section. Then the responses of both interviewees placed together in a single table 11 as following:

Table 11: Reponses of ERP consultant and CIO

Sr. No.	CSF	Response of ERP Consultant	Response of CIO
1	Project management	YES	YES
2	Top management support	YES	YES
3	Business process reengineering	YES	NO
4	ERP teamwork and composition	YES	YES
5	Effective communication	NO	YES
6	User training and education	YES	YES
7	Change management	NO	YES
8	Project champion	NO	YES
9	Qualified consultant selection	YES	NO
10	Consultant participation	YES	YES
11	User involvement	NO	NO
12	Business plan and vision	NO	YES
13	Culture readiness	NO	NO
14	ERP package selection	NO	NO

The above presented table11. is showing the responses of both interviewees the ERP consultant and the CIO of BRM. When these both responses placed together then author discovered the next direction for data analysis. The data is separated into four sections on the follwing foundations:

1. CSFs with”yes” from both sides
2. CSFs with ”No” from CIO but ”yes” fromERP consultant
3. CSFs with ”No” from ERP consultant but ”yes” from CIO
4. CSFs with”No” from both sides

Both yes means that the CSFs upon which both the ERP consultant and the CIO are agreed. ”No” from CIO means CIO does not agree on high importance of this CSF but ERP consultant considers it highly important CSF he found during the implementation of ERP system in BRM. ”No” from ERP consultant means that ERP consultant does not agree on high importance of this CSF but CIO consinders it is highly important as he dounf during the implementation of ERP system in BRM. Finally both ”No” means that both interviewees do not consider this CSF important during the implementation of ERP system in BRM. These four categories of CSFs are given in the following table 12.

Table 12: Four foundations to distribute CSFs

Factors with response ”Yes” from both interviewees	
1	Project management
2	Top management suport
3	User training and education
4	Consultant participation
5	ERP team work and composition

Factors with response ”Yes” from CIO but ”No” from ERP consultant	
1	Effective communication
2	Business plan and vision
3	Change management
4	Project champion

Factors with response ”Yes” from ERP consultant but ”No” from CIO	
1	Qualified consultant selection
2	Business process reengineering

Factors with response ”No” from both interviewees	
1	User involvement
2	Culture readiness
3	ERP package selection

In order to give responses a meaning full form the tabulation method really helped the author. Now the situation is quite clear after the division of CSFs in four categories. The readers can get a better idea now about the importance of CSFs in implementation of ERP system in BRM. They can know about the most important CSFs and the least important CSFs discussed in this study. The next objective of the author is to display the results of the study in form of a figure 5 that contains all these four categories of CSF. The motive is to provide comparisons among CSFs in a single view, for this purpose the author developed a grid which is presented in the next coming chapter of results and discussions. It is very difficult to draw any trend from the reasons provided by both participants but author tried to explain them in discussion part.

4 RESULTS, DISCUSSION AND LIMMITATIONS

4.1 Results

In the previous chapter author explained the data collection and its analysis. In the result of data analysis the author obtained four divisions of the CSFs. These divisions were based on high importance of CSFs and low importance of CSFs in opinions of CIO and ERP consultant. From this position the author obtained two dimensions one is importance and other is opinion. The author decided to scale these dimensions in a figure 5 about which the details are coming in next discussion.

The results of the thesis are presented in the form of a grid given in figure 5. On Y-axis the importance of CSFs near CIO is presented from low to high. On X-axis the importance of CSFs near ERP consultant is shown from low to high. In this way the figure 5 has constituted 4 quadrants. The quadrant (II) is presenting the most important CSFs in opinion of both CIO and ERP consultant. The quadrant (I) presents the CSFs that are highly important in opinion of CIO but less important in opinion of consultant. Similarly quadrant (IV) presents the CSFs which are highly important in opinion of consultant but less important in opinion of CIO of BRM. Finally the (III) quadrant presents the factors that are least important in opinion of the both persons.

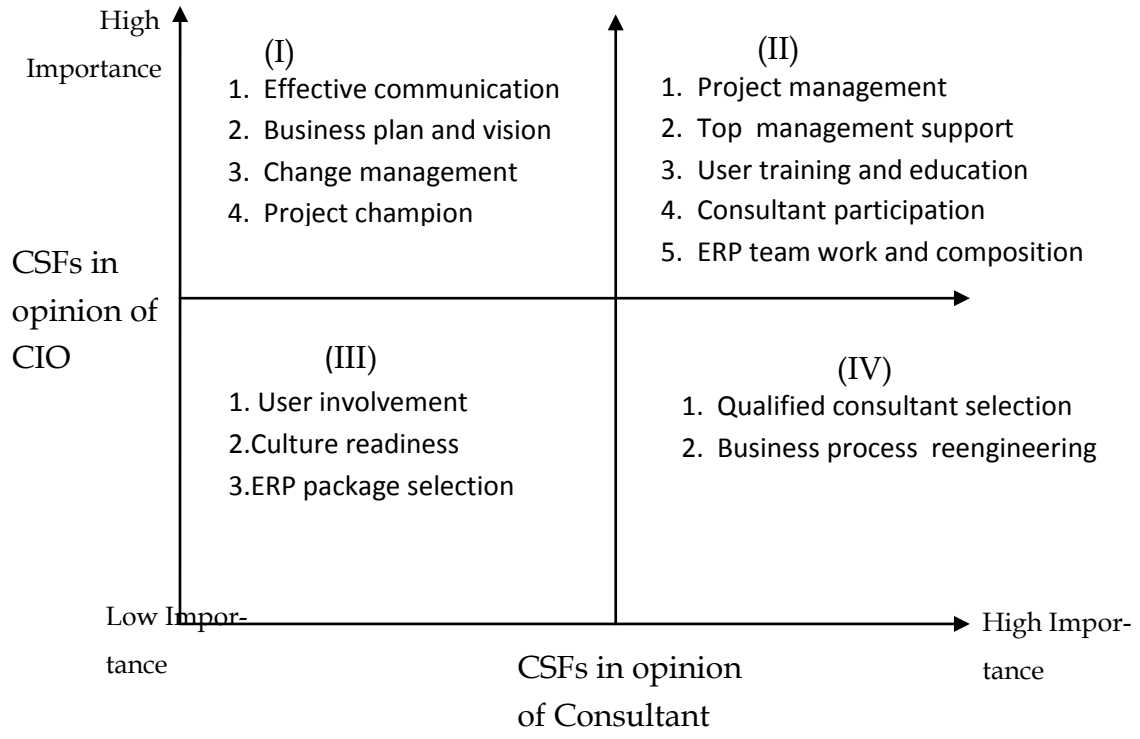


Figure 5: High important and less important CSFs

4.2 Discussion

In this sub chapter the author discussed and compared the reasons behind CSFs provided by the both interviewees. Each critical success factor is discussed from various dimensions. The discussion is arranged as per each CSF individually in the following way.

4.2.1 Project Management

Project management is a cycle of activities leads to implement the system as it is planned. These are the activities of planning, organizing, leading and controlling the processes to achieve the desired objectives (Françoise 2009). The planning of an ERP project consists of activities like planning the time, cost and scope of ERP project. A good project manager defines roles and responsibilities of the team involved in ERP implementation. He establishes a trust and communicates its expectations from the project. In this scenario, the role of ERP project manager is not limited to certain specific traditional project management activities but also he has to perform emerging roles e.g. a sales agent of ERP vendor, a marketing person of his services and a value contributor.

The study includes two project management teams one is the core project management team from the consultant's side and one is the help to implement team from the acquiring organization's side. The evidences collected from both parties shown that these both consider it as a highest important CSF in implementation of ERP system in BRM. The CIO of BRM as himself head of project management team from BRM realized the main responsibility. The CIO has to provide feedback to consultant that whether he is satisfied with the undergone activities, if not what the suggestions must be made from BRM. The words from CIO in response of a question related to project management were as "In my opinion the project management is most critical because if something lacks in this area or the project manager does not perform well the project will not be completed in time and if the ERP project of BRM becomes late then obviously it moves far from desired success".

ERP consultant team leader worked as a project manager from consultant side. He presented the reason behind high importance of this CSF that the ultimate knowledge and authority of implementation contained by project manager. If the project manager is not experienced and not familiar with critical failure situations the risk of the project will be high. The project management is a cycle of comprehensive activities that must be taken side by side. If any of the activities is not producing its results the overall success of the project will be affected. The consultant stressed on the importance of user training as a mandatory responsibility of project manager.

4.2.2 Top management support

Top management support is mandatory in ERP project implementation. The top management must give it high priority and it can be gained by attaching it with a strategic goal of the organization. In SMEs because of high financial cost of the ERP system the top management obviously concentrates on success of the project.

The BRM's representative emphasized on importance of the support from senior management because it ultimately creates some pressure on the ERP working team that results high efficiency of the human capital involved. Furthermore, when the strategic weight is given by top management to ERP project it creates a motivation for the staff. By acquiring ERP system BRM's top management claims value addition in its reputation among the competitors. Senior management strictly focuses on the output of the project, they ask what the company achieved from this system? Where is the improvement? So this seriousness from top management ultimately contributes a lot in the success of dynamics project in BRM.

The consultant is always looking for high support from the acquiring organization's top management. Because of lack of this support can cause a delay in completion of the project, that leads to increase in budgeted cost and other problems. Top management involvement provides a better understanding of the needs of the client. The implementer gains by having clarity of goals will be in a better position to accelerate the performance on project. By past experience of the implantation team leader from TMRC, most of the ERP projects failed because of lack of involvement and support from the senior management.

4.2.3 ERP teamwork and composition

ERP teamwork and composition are also important in both opinions collected in this study. CIO emphasized more on internal team structure developed by BRM, it is more important because all the levels of the organizations must communicate their needs from system to the consultant. In order to achieve this there should be proper representation of all organizational levels in the ERP team. The access and rights of lower management users and middle and top management users must be discussed in details between implementers and the hosts.

The consultant considered successful implementation impossible without a good ERP team and its structure. The team should be a good mix of internal and external workers, their attachments with each other must be logically done. Internal workers have a high important role to familiarize the external workers with the organizational

processes. Similarly external workers have to perform a high important role to train the internal workers and fulfill the demanded needs in the best way.

4.2.4 User training and education

Users training and their education is one of the main CSFs in success of ERP system in BRM. In the opinions of both participants in this study the selection of trainees is very crucial. Because the client has to provide certain staff for the "train the trainers" program. In which consultant's team trains the trainers of the BRM. These trainers of the BRM will train the other users in the organization. This will help to reduce the training cost and up to some extend it will make the BRM independent of consultant's training. It is high responsibility of the BRM's management to provide the skillful staff for a better training. Similarly on the other hand consultant's training team must be having thorough knowledge of the software and its functionalities. This will enable them to produce good ERP teachers. The negligence in the area of ERP user training and education can cause a considerable decrease in achieved benefits from ERP, in opinions of both CIO and the consultant.

4.2.5 Consultant participation

Consultant's participation is also very important in opinions of both participants. CIO considers a consultant all in all in ERP implementation matters. If the consultant participated well the project outcome will be great. The consultant must be a high stakeholder from the consulting firm, as in this case the consultant was a director of TMRC this causes a serious participation from consultant. He has to work as a project champion and to lead the whole project team. His on time suggestions to management and prompt respond to arise issues ultimately increase the success of system implementation. Consultant by himself also realizes the importance of consultant participation to act as a project leader. His proper participation in the project is like a life blood of the project. The meeting of consultant with top management and periodical progress report presentations increases the confidence of both stakeholders.

4.2.6 Effective communication

The CIO of the organization identified more CSFs as compare to the consultant. This CSF founded only in the response of CIO. He emphasized on the importance of proper

communication from internal team of BRM towards the team from consultant. The needs and desires must be properly communicated to the implementers. This will generate clarity of targets for the consultant. But on the other side consultant took this CSF as repetition, as the scope of this CSF is covered under the ERP team composition CSF.

4.2.7 Business plan and vision

Business plan and vision is only important near to CIO of BRM, because he is the stakeholder but the consultant is not stakeholder of the acquiring firm's business goal and vision. But a strategic goal from acquiring firm attached with the goals of ERP system implementation can obtain a high concentration from top management. CIO emphasized on his vision of increase in the efficiency of his organizational management, that acted as motivation getter for successful ERP implementation.

4.2.8 Change management and BPR

The CIO of BRM emphasized on change management while the consultant emphasized on the business process reengineering. In opinion of CIO the change in organization should be managed accurately in order to gain the desire productivity from system. While in the opinion of the consultant the business process reengineering is the prerequisite of change management, and if the processes are reengineered successfully the goals of change management will be automatically achieved.

4.2.9 Qualified consultant selection

The consultant has thrown light on the importance of qualified consultant selection. Because there are so under qualified consultants available in market that can cause an easy failure to ERP system implemented in your organization. This is the responsibility of the acquiring firm to judge the qualities and abilities of the consultant that they are going to hire. Because in the case of BRM there were two decisions attached with each other. One is the selection of the consultant and other is the ERP package selection because in such cases mostly consultants also act as ERP system reseller.

4.2.10 User involvement

This CSF is one of those who gain least importance in opinions of both participants to this study. The reason is the low degree of criticality. Because of predefined and standardized ERP package the user involvement is less important in case of BRM. The user involvement is important for highly customized and self developed ERP systems.

4.2.11 Culture readiness

Culture readiness neither got importance in opinion of CIO nor consultant. The reason is the local culture at BRM. Because of high job competition at local market, all the human resource of the organization is always ready for enhancement in the technology used. None of them wants to avoid the technological update because they are one of the stakeholders of this system.

4.2.12 ERP package selection

ERP package selection is given less importance from both respondents because all the packages available are standardized and fulfill the requirements of all organizations at same level. So the success of an ERP system is not critically dependent on selection of ERP software package.

4.3 Significance behind the importance of CSFs

From the grid presented in figure 5 author derived 2 lists that can be end result of this study. One list is the list of highly important CSFs presented in table 13.These are the 5 CSFs to whom all the managers and consultants should give the full attention in order to achieve success. And 3 CSFs are those which are not important for ERP implementation in SME organizations in Pakistan. This list of less important CSFs is also presented in table 13. The managers can compromise on these factors but the highly important CSFs should not be compromised.

Table 13: Results and suggestion from the study

Highly important CSFs suggested by this study for ERP system implementation in SMEs.	
1.	Project management
2.	Top management support
3.	ERP teamwork and composition
4.	User training and education
5.	Consultant participation

Less important CSFs suggested by this study for ERP system implementation in SMEs.	
1)	User involvement
2)	Culture readiness
3)	ERP package selection

4.3.1 Why some CSFs are highly important for Pakistani SMEs

In order to understand the significance behind these highly important CSFs it is necessary to look at the reasons provided by the both participants. For “project management” both participants emphasized on the role of project manager. This CSF is closely connected with the planning and organizing activities of the project. If an ERP project is not accurately planned then the successful implementation is more critical. Furthermore

if the planned project is not organized up to the mark by the project manager then it also hinders the achievement of goals. For Pakistani SMEs the power and responsibility of the success of project is centralized towards one person that is project manager. Same reason is for “top management support”, because of centralized organizational structure the authority prevails at top levels. In the opinion of both participants the seriousness and proper attention from top management can enhance the success chances moderately. Consultant emphasized on bigger stake of organization’s top management, if management really wants to achieve targets then there is no reason for negligence from consultant.

In Pakistani SMEs team culture is really lacking. The team composition and proper respresentation from all departments helps in smooth implementation of the system, this is the crux of opinions from both consultant and CIO. Consultant acts as a team leader and coordinate the all members by giving them directions. The learning by working in a team is different from learning by a training session. End users need to be trained for themselves only, but the key employees should be trained as a trainers. If this training department of the project is not adiquately addressed then it will look like the proper benifits from projects are not derived. In Pakistani SMEs ”train the trainers” concept is almost unknown.

”Consultant participation” is a question mark for SMEs in Pakistan. Because of lack of certified and qualified consultants and their high demand in SMEs made this CSF more critically important. Consultant by himself admitted that they work usually on more than one projects at a time, and they give more attention to that organization’s project whom management shows commitment with the ERP project. CIO also emphasized on proper participation from consultant at all stages and in all matters related to the project. Even CIO considers this CSF more critical than consultant selection.

4.3.2 Why some CSFs are less important / critical for Pakistani SMEs

Less critical / important means their roles in success of ERP implementation are limited. These are the areas from which managers and consultants can shift their attention towards highly important / critical matters of ERP project. One positive thing about ERP is its standardization i.e. one pre-developed ERP for all SMEs, this reduces the criticality of end user involvement in ERP implementation for Pakistani SMEs. Both interviewees emphasized on training of end users instead of their involvement in implementation. In case of Pakistani SMEs the user involvement is important when the package is massively customized which is rare in this case. The study recommends ERP

managers in Pakistani SMEs to concentrate more on user training instead of user involvement.

One positive thing about the culture of SMEs in Pakistan is their readiness towards new technologies. Employees do not hesitate to adopt new system. In the opinion of consultant and CIO the reason behind this culture readiness in Pakistani SMEs is the high competition for jobs. People feel their job insecure if they show a reluctant attitude to adopt new technologies. So this culture readiness is already present there, the ERP managers should not be worry about this they should spend their time on other important matters related to ERP. The last CSF that got less importance is “ERP package selection”. The opinion of consultant in this regard is more important because he has more knowledge about the available ERP packages. But both the consultant and CIO consider most of the available ERP packages as to serve the same purpose and perform the same functions. The management system of Pakistani ERP is not so complex therefore any of the ERP package can be fit here. According to ERP consultant any ERP for SMEs in Pakistan can provide best integration, resource management and reporting. Therefore this CSF can be placed as a less important in case of Pakistani SMEs.

4.4 Limitations and future research possibilities

The foundation of study placed through literature review has some limited applicability. The study collected CSFs from literature review related to implementation of ERP in large, medium and small organizations and then tested its applicability over SMEs. The CSFs which are highly important for large enterprises may or may not be highly important for SMEs. The selected research method case study has ordinary limitation over its generalize ability. The CSFs identified from one SME may or may not be same for the other SMEs in other industries. The critical success factors in implementation of ERP system are different in a manufacturing company and a services company.

The evidences in this study are collected from only two persons but the remaining staff of the acquiring organization and the consultancy firm is not involved. The CSFs in opinion of CIO may or may not be same in opinions of CFO and CEO etc. Because the ERP system is as important as is for all other departmental heads in a SME organization. Similarly the consultant team consists of various ERP professionals, the interviewing only head of the team may not ensure 100% accurate evidence collection. In the data analysis part the reasons behind highly important or least important CSFs are more important and they should be also processed and compared visually.

The above described limitations are not just criticism but also provide directions for future research in this area. The author suggests to forthcoming research students to explore the each CSF in ERP implementation in SMEs individually. The project management should be explored more in detail in opinions of the stakeholders involved in ERP implementation in SME. In which dimensions this CSF affects the process of ERP implementation in SMEs. The span of evidence collection should be wider to the other ERP professionals involved in the process of implementation. The reasons behind the intensity of criticality of each CSF can be explored and visualized graphically. Similarly the remaining important CSFs in implementation of ERP system in SMEs i.e. top management support, user training and education and consultant selection can be explored in the same way.

In Pakistan the ERP system consultancy industry is growing with massive speed but still not fulfilling the demand. A lot of organizations are looking for consultants to implement ERP system in their organization. The research scope can spread over whole ERP consultancy industry. There is an opportunity to collect data by interviewing various consultants that have implemented ERP system in various industries. This will definitely increase the reliability and authenticity of the study. The CSFs frameworks can be established as per industry wise e.g. textiles, rice mills, sugar mills, flour mills and services industry etc.

5 CONCLUSION

SMEs have realized the importance of ERP system and seriously looking for successful implementation. The successful implementation of the system is only way to derive the benefits associated with it. The success of ERP system in a SME is linked with careful management of five important factors, the project management, top management support, user training and education, consultant participation and ERP teamwork and composition, this is the crux of opinion given by ERP consultant and CIO of the acquiring organization. The effective communication between the participating teams in the ERP project can lead to a better result. CIO of SME believes that participation from ERP consultant decides the success, a consultant must be involved in each and every

In order to achieve the increased effective management by ERP system in SMEs the user training should be given high concentration. The training and education is not just limited to a one time training session, it is a throughout involvement of the trainee staff with implementation process, this requires an effective use of “train the trainers” technique. The top management has to show supportive behavior to the project, it requires proper concentration over performance of the project and a check and balance over consultant and CIO. The project team composition demands merit strictly, the proper representation to all departments at stake must be given. The achievement of planned project objectives, highly depend upon the minimization of the risks connected with important CSFs.

Beside some limitations, the study contributed interesting outcomes in the literature. The ERP consultants are rarely involved in ERP research. This study explored another direction to look ERP in SMEs from a different angle. Most of the organizations in Asian markets employ the ERP system through a gold certified consultant by the vendor. There are huge opportunities to investigate the success of ERP in SMEs by the involvement of consultant and client as a two independent stakeholders. ERP vendors are spending massive budgets over the research in SMEs in Asian markets in order to increase the success rate. Finally CSF framework can be so much beneficial in order to explore the potential in these research opportunities.

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APPENDIXES

APPENDIX 1

Summary of the selected articles

Sr No.	Author	Title	Journal	Research Question	Research methodology and data collection Method
1	Ahmad et al. (2013)	Compilation of Critical Success Factors in Implementation of Enterprise Systems: A Study on Indian Organisations	Global Journal of Flexible Systems Management	What are the critical success factors of ES implementation and their relative importance in Indian context?	Review
2	Ram et al. (2013)	Implementation critical success factors (CSFs) for ERP: Do they contribute to implementation success and post-implementation performance?	International Journal of Production Economics	Whether some factors labelled as "critical" success factors for ERP projects are in practice actually critical for achieving success in implementation and improving output performance ?	Quantitative, Survey
3	Saini et al. (2013)	Identifying success factors for implementation of ERP at Indian SMEs	Journal of Modelling in Management	What are the critical success factors (CSF) for ERP implementation in SMEs in India and how are these factors different from the factors for larger Indian organizations and the global organizations?	Quanitative, Survey
4	Hasibuan & Dantes (2012)	Priority of Key Success Factors (KSFS) on Enterprise Resource Planning (ERP) System Implementation Life Cycle	Journal of Enterprise Resource Planning Studies	What are the Key Success Factors (KSFS) on Enterprise Resource Planning (ERP) System Implementation Life Cycle	Quantitative, Survey

5	Khadija & Elmeziane (2012)	Enterprise Resources Planning Systems Implementation Success In China	Business and Management Review	What is the degree of importance of each Human Resources (HR) requirement factor in their ERP implementations	Quantitative, Survey
6	Khattak et al. (2012)	Examining critical success factors affecting ERP implementations in enterprises of Pakistan	Interdisciplinary Journal of contemporary research in business	What are the critical, least critical and not critical success factors in implementation of ERP in SMEs	Qualitative, Multiple case studies, Survey
7	Ahmadi et al. (2011)	Determining Enterprise Resource Planning (ERP) Success Factors in Iranian Companies	European Journal of Economics, Finance and Administrative Sciences	What are the Enterprise Resource Planning (ERP) Success Factors in Iranian Companies	Quantitative, Interviewing ERP experts in IRAN
8	Aldayel et al. (2011)	The Critical Success Factors of ERP implementation in Highe r Education in Saudi Arabia	Journal of Information Technology and Economic Development	What are the Critical Success Factors of ERP implementation in Higher Education in Saudi Arabia.	Qualitative, Case study, Survey
9	Yulong Li (2011)	ERP adoption in Chinese small enterprise: an exploratory case study	Journal of Manufacturing Technology Management	What are the critical success factors and how these factors affect ERP adoption in a small farming feed manufacturing company	Qualitative, Case study, Interviews
10	Moohebat et al. (2011)	Evaluation of the ERP Implementation at Esfahan Steel Company Based on Five Critical Success Factors: A Case Study	International Journal of Business and Management	How much successful ERP is implemented at Esphehan Steel Company base on CSFs.	Qualitative, Case study, Interview
11	Venugopal & Rao (2011)	Learning from a failed ERP implementation: a case study research	International Journal of Managing Projects in Business	Why do ERP projects fail?	Qualitative, Case study, interviews
12	Dezdar & Sulaiman (2009)	Successful enterprise resource planning implementation: taxonomy of critical factors	Industrial Management & Data Systems	What are the CSF identified in literature in successful implementation of ERP system	Literature Review, Content Analysis, coading

13	Finney & Corbett (2007)	ERP implementation: a compilation and analysis of critical success factors	Business Process Management Journal	How a CSF affect the implementation of ERP system.	Literature Review, Content Analysis
14	Francoise et al. (2009)	ERP implementation through critical success factors management	Business Process Management Journal	What are the practical activities (CSF) essential for managing enterprise resource planning (ERP) implementation.	Quantitative, Literature Review, Delphi survey
15	Ghosh & Skibniewski (2010)	ENTERPRISE RESOURCE PLANNING SYSTEMS IMPLEMENTATION AS A COMPLEX PROJECT: A CONCEPTUAL FRAMEWORK	Journal of Business Economics and Management	What are the complexities in ERP system implementatioin project.	Literature Review
16	Holodnik-Janczura & Lerka (2011)	EVALUATION OF THE INFLUENCE OF SELECTED FACTORS ON A SUCCESSFUL ERP SOFTWARE IMPLEMENTATION	Operations Research & Decisions	How a factor influences the success of ERP software implementation	Quantitative, Survey
17	Loh & Koh (2004)	Critical elements for a successful enterprise resource planning implementation in small- and medium-sized enterprises	International journal of prodection research	What are the critical elements that constitute a successful ERP implementation in SMEs	Qualitative, Literature review, multiple case studies, interviews
18	Malhotra & Temponi (2010)	Critical decisions for ERP integration: Small business issues	International Journal of Information Management	What are the Critical decisions for ERP integration in Small businesses	Qualitative, Multiple case studies, Interviews of the SME Managers/owners
19	Ahmad & Cuenca (2013)	Critical success factors for ERP implementation in SMEs	Robotics and Computer-Integrated Manufacturing	Three basic research questions were addressed. First, what are the main critical success factors? Second, how do these factors interact throughout the implementation process? Third, which factors have the highest impact and in what stages?	Quantitative, Literature Review and Survey

20	Pang-Lo-Liu (2011)	Empirical study on influence of critical success factors on ERP knowledge management on management performance in high-tech industries in Taiwan	Expert Systems with Applications	What are the CSFs for the introduction of ERP KM and the influence of these CSFs on management performance in the Taiwanese high-tech industry.	Quantitative, Survey
21	Snider et al. (2009)	ERP implementation at SMEs: analysis of five Canadian cases	International Journal of Operations & Production Management	What are the critical success factors (CSFs) of enterprise resource planning (ERP) system implementation in small and medium-sized enterprises (SMEs).	Qualitative, multiple case studies, Interviews
22	Soja (2006)	Success factors in ERP systems implementations Lessons from practice	Journal of Enterprise Information Management	What is the mechanisms determining ERP implementation success,	Quantitative, Survey
23	Sun et al. (2005)	Achievement assessment for enterprise resource planning (ERP) system implementations based on critical success factors (CSFs)	International Journal of Production Economics	What are the CSFs in implementation of ERP in SMEs	Quantitative, Survey
24	Wickramasinghe & Gunawardena (2010)	Critical elements that discriminate between successful and unsuccessful ERP implementations in Sri Lanka	Journal of Enterprise Information Management	What are the critical elements (CEs) in implementation of enterprise resource planning (ERP) determining success.	Quantitative, Survey
25	Woo (2007)	Critical success factors for implementing ERP: the case of a Chinese electronics manufacturer	Journal of Manufacturing Technology Management	What are the CSFs in implementation of ERP in Chinese SMEs	Qualitative, Case study, semi structured interview
26	Zabjek et al. (2009)	The influence of business process management and some other CSFs on successful ERP implementation	Business Process Management Journal	What is the impact of top management support, change management, and BPM on successful ERP implementation.	Quantitative, Survey

APPENDIX 2 :CSF Literature Review

Sr No. →	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CSFs→ **Authors** ↓	ERP teamwork and composition	Business process re engineering	Top management support	Project management	Effective communication	Culture readiness	ERP implementation strategy	ERP implementation methodology	Strong ERP product	User training and education	Change management	Business plan and vision	Project champion	Performance evaluation	Software development and testing	Project competence	Reward system	User involvement	ERP package selection	Information security	Alignment of goals	User friendliness	Compatibility with existing struc-ture
Ahmad et al. (2013)		1					1												1				
Ram et al. (2013)		1		1						1				1									
Saini et al. (2013)	1	1	1	1	1					1	1	1	1		1				1				
Hasibuan&Dantes (2012)	1	1	1	1	1	1	1	1	1	1													
Khadija &Elmeziane (2012)					1					1	1					1	1						
Khattak et al. (2012)	1	1	1	1	1		1	1		1	1		1					1			1	1	
Ahmadi et al. (2011)			1	1	1					1									1	1	1	1	1
Aldayel et al. (2011)	1	1	1	1															1				
Yulong Li (2011)			1	1		1				1	1												
Moohebat et al. (2011)	1	1	1	1														1					
Venugopal&Rao (2011)		1	1		1								1						1				
Dezdar&Sulaiman (2009)	1	1	1	1	1	1				1	1		1	1	1			1	1				
Finney & Corbett (2007)	1	1	1	1	1	1	1				1	1	1						1				
Francoise et al. (2009)	1	1	1	1	1	1					1	1	1	1	1			1					
Ghosh&Skibniewski (2010)	1	1	1	1	1					1	1	1											
Holodnik-Janczura&Lerka (2011)	1	1		1	1					1			1					1					
Loh&Koh (2004)	1	1	1	1	1						1	1	1	1	1								
Mal-hotra&Temponi (2010)	1						1				1												
Ahmad & Cuenca (2013)	1		1	1	1	1								1									
Pang-Lo-Liu (2011)		1	1	1						1		1											
Snider et al. (2009)	1		1	1						1													
Soja (2006)	1	1	1	1	1		1	1	1	1	1		1			1		1					
Sun et al. (2005)	1	1	1							1					1			1					
Wick-ramasinghe&Gunawardena (2010)	1	1	1	1	1	1				1	1	1	1	1	1			1					
Woo (2007)	1		1	1	1					1	1												
Zabjek et al. (2009)	1	1	1	1	1					1	1							1					
Total Score of each CSF →	19	19	21	21	17	7	6	3	2	17	14	7	10	6	6	2	1	9	7	1	2	2	1

Table (Part I). CSF Literature Review (Cont.)

Sr No. →	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
CSFs→ **Authors ↓**	Capability of integration	Reliability of ERP product	Departments participation	Choosing of ERP supplier	Consultant participation	Operational process and dicipline	Qualified consultant selection	Transition technique	Db conversion	Risk management	System testing	Financial budget	Pre implementation analysis	Data analysis	Knowledge management	Legacy system	Organizational structure	Clear goals and objevtices	Minimal customization	Resource availability	Technical readiness	Steering committee
Ahmad et al. (2013)	1				1				1													
Ram et al. (2013)	1																					
Saini et al. (2013)					1		1		1							1	1					
Hasibuan&Dantes (2012)																						
Khadija &Elmeziane (2012)																						
Khattak et al. (2012)	1			1	1		1											1				
Ahmadi et al. (2011)	1	1																				
Aldayel et al. (2011)	1		1	1	1																	
Yulong Li (2011)					1		1													1	1	
Moohebat et al. (2011)																						
Venugopal&Rao (2011)																1						
Dezdar&Sulaiman (2009)					1		1									1						
Finney & Corbett (2007)							1		1		1											
Francoise et al. (2009)															1							
Ghosh&Skibniewski (2010)																						
Holodnik-Janczura&Lerka (2011)			1	1	1		1		1											1		1
Loh&Koh (2004)																						
Mal-hotra&Temponi (2010)								1	1	1												
Ahmad & Cuenca (2013)							1							1								
Pang-Lo-Liu (2011)				1	1		1															
Snider et al. (2009)						1	1															
Soja (2006)					1							1	1									
Sun et al. (2005)	1														1							
Wick-ramasinghe&Gunawardena (2010)			1													1			1			
Woo (2007)																						
Zabjek et al. (2009)							1									1		1	1			
Total Score of each CSF →	6	1	3	4	9	1	10	1	5	1	1	1	1	1	2	5	1	2	2	2	1	1

Table (Part II). CSF Literature Review

APPENDIX 3

Questionnaire for semi structured interviews.

The research question of undergone thesis is “What are the critical success factors in implementation of ERP system in SMEs in opinion of ERP consultants and acquiring organizations?”.

The stakeholders of this study are ERP consultants, ERP acquiring SMEs, ERP students, ERP developers etc.

Following is the list of 14 questions asked in interview.

1. Do you agree on “Project management” as an important CSF in implementation of dynamics GP in BRM ? Yes / No
   Reason: Why you consider this CSF as an important ?or why not ?
2. Do you agree on “Top management support” as an important CSF in implementation of dynamics GP in BRM ? Yes / No
   Reason: Why you consider this CSF as an important ?or why not ?
3. Do you agree on “Business process reengineering” as an important CSF in implementation of dynamics GP in BRM ? Yes / No
   Reason: Why you consider this CSF as an important ?or why not ?
4. Do you agree on “ERP teamwork and composition” as an important CSF in implementation of dynamics GP in BRM ? Yes / No
   Reason: Why you consider this CSF as an important ?or why not ?
5. Do you agree on “Effective communication” as an important CSF in implementation of dynamics GP in BRM ? Yes / No
   Reason: Why you consider this CSF as an important ?or why not ?
6. Do you agree on “User training and education” as an important CSF in implementation of dynamics GP in BRM ? Yes / No
   Reason: Why you consider this CSF as an important ?or why not ?
7. Do you agree on “Change management” as an important CSF in implementation of dynamics GP in BRM ? Yes / No
   Reason: Why you consider this CSF as an important ?or why not ?
8. Do you agree on “Project champion” as an important CSF in implementation of dynamics GP in BRM ? Yes / No
   Reason: Why you consider this CSF as an important ?or why not ?
9. Do you agree on “Qualified consultant selection” as an important CSF in implementation of dynamics GP in BRM ? Yes / No

Reason: Why you consider this CSF as an important ?or why not ?

10. Do you agree on “Consultant participation” as an important CSF in implementation of dynamics GP in BRM ? Yes / No
    Reason: Why you consider this CSF as an important ?or why not ?
11. Do you agree on “User involvement” as an important CSF in implementation of dynamics GP in BRM ? Yes / No
    Reason: Why you consider this CSF as an important ?or why not ?
12. Do you agree on “Culture readiness” as an important CSF in implementation of dynamics GP in BRM ? Yes / No
    Reason: Why you consider this CSF as an important ?or why not ?
13. Do you agree on “ERP package selection” as an important CSF in implementation of dynamics GP in BRM ? Yes / No
    Reason: Why you consider this CSF as an important ?or why not ?
14. Do you agree on “Business plan and vision” as an important CSF in implementation of dynamics GP in BRM ? Yes / No
    Reason: Why you consider this CSF as an important ?or why not ?