EXPLORING THE FACTORS AFFECTING ERP IMPLEMENTATION QUALITY

M. Umar[1], N. Khan[2], M.H. Agha[3], M. Abbas[4]
[1]Department of Engineering Management, Center for Advance Studies in Engineering (C@SE), Islamabad-Pakistan
[2]Department of Engineering Management, NUST College of EME, Rawalpindi-Pakistan
[3]Faculty of Engineering, Capital University of Science and Technology, Islamabad-Pakistan
[4]Faculty of Computer Engineering, NUST College of EME, Rawalpindi-Pakistan

ABSTRACT

ERP implementation projects bring tremendous advantage in spite of high cost involved and complex implementation process. The purpose of this study is to formulate a strategy to overcome ERP implementation specific challenges for the industries of developing country like Pakistan. A theoretical framework has been developed based on 87 critical failure factors obtained from comprehensive literature review divided into five main areas. Interview has been conducted from 20 organizations of Pakistan involving 40 participants from the recipient client organizations, vendors and consultant and 152 factors are identified using NVIVO for data analysis. The Critical Factors obtained from both literature and interviews were mapped to develop a conceptual framework. Results depict that Top Management Involvement and Support, Project Management, Change Management, Education and Training, Business Process Re-Engineering and Vendor Management are major factors to improve Quality of ERP implementation in Pakistan. These Critical Success Factors and there attributes are valuable contribution for the recipient client organization, ERP implementers/vendors and consultants.

Keywords*: Critical Factor, ERP Implementation, Quality*

1) INTRODUCTION

ERP is a complete business solution that deals with all the major business function of an organization. It is an integrated, configurable and customizable package that is highly responsive to the changing business needs (Thomas, 1998). ERP provides competitive advantage to the organization through improved control and better visibility in the information. It brings robust change and dramatic improvement that leads to innovation and smart decision during operations (Chung, 2007). There are various vendors that provide ERP solutions. However, the main vendors are SAP, Microsoft Dynamic, Oracle, JD Edward and People-soft etc. SAP captures the major market share of the world (H. Davenport, 1998). AMR research group published a report in which market share of ERP in 2006 was $28.8 billion and in 2011 it has grown into $47.7 billion. Due to this reason ERP in considered one of the most important innovations of the previous decade (Al-Mashari, 2002).

Literature shows that implementation of ERP one of the most complex decisions that organizations take, because these projects are considered large scale projects in terms of scope, cost, time and people involved in the implementation process. ERP implementation demands strong commitment by the all the resources from the top management to the lower management (Cooke et al, 2001). It's a huge transformation that brings tremendous change in all aspects of the organization (Majed, 2003). ERP appears to be the most widely accepted solution in both developed and developing countries. However, the comparative growth is not as promising as in the technologically advanced countries due to non-availability of comprehensive guidelines for developing countries. Most of the research is devoted for developed countries and only 10-15% of ERP Global research is dedicated for Developing countries (Zhe Zhang, 2005). Literature also points out some additional challenges that developing countries has to face like economic, culture and infrastructure issues that cause failure and part of important concern (Panorama Consulting Solutions,"2014)(P. Soja, 2008). Another reason for high ERP failure rate is the lack of availability of slandered guidelines for developing countries. Public and government sector organizations are also tending to move towards ERP for real time information and to gain better administrative control (Gholamhosein, 2010). Such organizations have more social obligations, public accountability, and higher legislative and unique culture (Saquib and Rubana, 2011). Hence it can be concluded that ERP

implementation is huge transformation coupled with high risk and cost. However, against all this, it can deliver high outcomes if it is implemented in organized way.

There are various studies available for ERP implementation and about its failure factors in different countries like India, China, Saudi Arabia, Jordan, Sri Lanka, Oman, Malysia, Iran, Egypt and Tunisia (Amin et al, 2012). But currently no study is available that is dedicated for the industry in Pakistan. The main purpose of the present study is to identify the critical success factors that improve the quality of ERP implementation. Critical Success factors are defined as "The few critical areas where things must go right for the business to flourish" (J.F.Rockhart, 1979). The study is divided into different sections contains Literature Review, Research Methodology, Conclusions with Discussion and Recommendations at the end.

2) LITERATURE REVIEW

Literature provides strong evidence of high failure rate of ERP implementation projects i.e. 70% of ERP projects failed to provide the expected benefits and three quarters are not able to gain success. Research report shows that these projects 178% over budget and face delay 2.5 times as that planned by giving only 30% of the promised benefits (Al-Mashari, 2002). However, there various benefits due to which organizations shifts towards ERP like better customer care and retention, improve financials, ,improved productivity, better information management, improved decision making, better asset management, ease of growth or expansion with enhance flexibility, accurate and quick transactions, reduction in cycle time and head count, less resources and improve revenue(Shang et al, 2000). ERP implementation success relies not only on organizational internal factors like project management, top management involvement etc. but also organizational external factor like role of vendor, consultant commitment etc. Similarly, IT governance plays vital role for the successful implementation of ERP (Wen-Hsien, 2013). There is huge growth in enterprise system projects across the globe in the last two decades resulted into significant increase in ERP market share (Gholamhosein, 2010). However, ERP adoption in developing countries like Pakistan is low because of high cost involved, lack of knowledge of people using it, culture integration etc. (Rajapakse and Peter, 2005). ERP implementation growth rate in India is around Rs. 40, 0000 million and seems to be growing in with 25% growth rate in upcoming three to four years (Suraj, 2013). Indian

SME's are also shifting towards enterprise system to gain competitive advantage using real time information and to improve customer response time (P.T. Kale et al, 2010). There are different factors that impact the success of ERP implementation depends upon region, size of project, people involved in the project. However, there are some factors that are common to gain desired outcome from the ERP project. Firstly, it is very important for an organization to choose the right ERP package that is aligned with the corporate culture, flexible enough to full fill the organizational needs and covers all its major business functions (Jamie, 2013).

A research study conducted in 18-different parts of the world and "Top Management Commitment" and "Education and Training" were the most commonly cited factors for the success of ERP implementation (Ngai et al, 2008). How much the best business practices are customized also play important role for the success of ERP project. Organization should avoid unnecessary customization (Rothenberger, 2009). A tremendous effort for change is required to shift people on best business practices and if this change is properly managed then it will bring dramatic effect on the outcomes of ERP project. To achieve the desired goal for an organization, the consultant and the client should work on agreed upon strategy and that implementation will play important role for ERP success (Zain, 1995). Before going to CSF and CFF it is important differentiate success and failure of ERP implementation.

2.1) Success of ERP

Different stakeholder defines ERP project success from their own way. For project manager if the project is completed with in time and within budget then the project is successful. For users point of view if the system is user friendly and brings efficiency in daily tasks then the project is successful, business owners rates the project success in terms of ROI (Jiwat, 2013). However, there are some common areas that define the success of ERP projects like system quality, information quality, service quality, tactical impact and strategical impact (Zainal and Gede, 2012) [17]. Another study shows that if an organization is not able to obtain the desire objectives then it should be considered as failed implementation (Suraj, 2013). Similarly, there are some other researchers that link success with obtaining substantial amount of organizational objectives (Thomas, 1998), (E.Umble et al, 2003). However, it is important for an organization to choose the right

ERP package that is aligned with the organizations need and brings positive financial return on investment (Suraj, 2013).

2.2) Failure of ERP

It is beyond all doubts that ERP brings tremendous advantage but organizations avoid to implement ERP due to complex implementation process and high failure rate. ERP projects faced either complete failure or partial failure. Complete failure means either the projects failed completely before implementation or implemented in such a way that the company has to face huge financial loss. Partial failure means misalignment in processes cause disruption in routine operations (Vidyaranya, 2005). High failure rate of ERP implementation projects has generated lot of interest in the research community and this thing becomes a source of increment in the body of knowledge (Ann and Peter, 2003). There are different reasons of ERP implementation failure available in literature. One of the main reasons that came out is the misalignment of processes in developing and under developed countries while using foreign ERP. The internal structure of the processes embedded in the system does not full fill the needs of underdeveloped or developing countries (Y. Xue, 2005).

There are lots of worlds renowned companies faced ERP implementation failures like Nike, FoxMayer, Hershey and many more. This failure resulted into jeopardizing the business core operations and shifted the company towards bankruptcy (M. Cotteleer, 2002). ERP implementation failure rate in US firms is also very high ranging from approximately 50 to 75 %. Literature depicts that 51% of US firms perceived their ERP implementation as not successful and 70% of all ERP projects fail to be fully implemented (E.Umble et al, 2003). Standish research group rates ERP success in China approximately 10%. Another study is conducted based on the data taken form 117 companies having ERP projects and the results shows that 55% projects not able to achieve the desire objectives, 25% faced budget overrun and 20% projects stopped abnormal (Cooke et al, 2001).

Panorama Consulting Solutions is a well-known consulting firm specializing in the ERP, their latest surveys in 2015 shows that more than 55% of projects budget overrun whereas above 75% of project schedule overrun and about 41% of the respondents have a point of view that ERP delivered half of the expected benefits. The last five year data of panorama

independent research provides the average cost of ERP implementation projects that is about $6.1million whereas the average duration of the ERP implantation projects has been 15.7 months. The research results shows that out of these project 58% of project have crossed the planned budget and 65% of the project faced delay and could not be completed according to their planned duration. There are 53% of the organization that could not achieve half of the benefits planned at the start of the project (Panorama Consulting Solutions, 2014). Such high alarming ERP implementation failure rate got overwhelming attention of researchers. Literature also shows that there is only 6% article that has explored CSF in ERP implementation projects from year 1998 to 2007 [50] that shows the less research work done in this area. When the similar type study was conducted for CFFs then it was found even less than 1% (G. Pan et al, 2008).

3) RESEARCH METHODOLOGY

Qualitative method of research has been adopted in the study. It is more flexible approach in which respondents verbal and non-verbal communications have been analyzed their natural settings (N. K. Denzin and Y. S. Lincoln, 2014). Another good thing about qualitative research is that it explores, interpret and obtain a detail and deep understanding of the problem (Strauss, A. & Corbin, 1990). First of all rigorous in depth literature review has been conducted to identify the critical failure factors during ERP implementation process and total 87 critical failure factors have been identified . These factors have been divided into 5-groups based on the personal judgement and expert opinion. The factors are lack of top management involvement, poor project management, poor change management, poor business process reengineering and lack of education & training. The purpose is to identify the failure reasons and develop a strategy to handle these critical factors.

The dependent and independent variables identified as shown in the Table-1.

Table 1: Dependent and Independent Variables

SR#	Independent Variables	Dependent Variables
1)	Lack of Top Management involvement & Support	Poor Quality of ERP Implementation
2)	Poor Project Management	
3)	Lack of Change Management	
4)	Lack of Education & Training	
5)	Poor Business Process Reengineering	

Semi structured interviews have been conducted of the organization of Pakistan having ERP implemented or in the process of implementation. There were 40 participants from twenty different organizations who have provided face to face valuable insight about the research topic comprising of 30 to 40 minute duration. Convenience sampling technique has been adopted due to its simplicity and nature of the study. Those public sector and private sectors organizations have been selected that have at least more than three modules implemented and completed their ERP acquisition not later than five years. Specifically to identify the critical failure factors (CFF) such organizations are approached that failed in implementation of ERP (may be analyze failure period only). To identify the critical success factors (CSF) case studies of the organization are taken where ERP implementation remains successful or ((may be analyze success period only)). Interview protocol is used while taking interviews from the participants. Two people from client side and two people from vendor side have been targeted from each organization. When themes start reoccurring then a stage of theoretical saturation occurred and interview process stopped. Other related document of the project like lesson learned reports are also analyzed to bring more clarity about the critical factors.

For data analysis NVIVO version-10 software has been used because it is one of the trustworthy software to analyze qualitative data. Various techniques with in NVIVO were adopted to analyze data like thematic analysis, word tag cloud, word tree analysis, tree map analysis and word frequency analysis. Recorded data has converted into text format and then different themes have been extracted from that from that textual data, then these themes have been coded into different related themes. Thematic analysis is an approach for data analysis to develop themes by creation and application of different codes to data. In qualitative research thematic

analysis is recognized more practical way to discover something new through interpretation (Alhojailan, & Ibrahim, 2012). This technique is also useful to analyze the diverse aspect of the topic (James and Angela, 2007). From the interview process 152 themes has been extracted as shown in Figure1using NVIVO.

ERP Implementation Success

Eliminate vendore dependencies	Capable and qulified team	Work on capacity building	Involve fresh graduate	Strong funding
Timely involvement of consultant	Knowledge sharing culture	Standerized documentation	Enforce TM use system	Domain expert trainees
Use accelators for quick win	Adopt ERP in friedly way	Identify actual user & gv ownership	TM win trust not redundant	Involvement of core users
Train the trainer	Avoid golden hand-shake	Risk Management	TM Influential role.	Orrientation in START of BPR phase
Hire director trainings	Extensive testing by experts	PM specification detail of project	Timely decesion TM	Clarity in existing processes
Trainees identification	Integration point numbered	ASAP methodology	Higher seasoned consultant	Proper Requirement gathering
Establish CMt department	Define all role	Eliminate redundant work	Change mindset & motivate	Legacy and new not run in paralle
Establish Helpline	Support center	Educaitonal level of client	Document change areas and share	Market benifit of ERP
Share business blue prints	Thorough Testing	Right formation of team	PM daily-log meetings-follow up	Domain expert should be part of UAT
Ressolve integiration points	QC check at each stage	Define JDS & KPIS	Win loyality of consultant & trust	PM relationship and psychology mgt
Monitor process change areas	PM techenical and p.mgtt skill set	Do ERP recruitment	PM update status CXO's	Clarity of vision
Team motivation	Build trust, authorities not influenced	Vision of TM	Capable team	TM M&C
TO BE by experts	Communicate with consultats	Internet bandwitdth	Right people-volunteers	Show prototype to end users
Update project status TM	Awards to good performers	Influential top mangment	Involve all dept	Win loyality of consultant and trust
Module integration issues	Knowledger sharing culutre	Right choice of consultants	Avoid transfer-posting	Remove Fears of system
Role identification&configure	Monitor integration points	Clarity of existing processes	Empower people	Shift traditional to best practices
PM to identify bottle-necks	Effective communicaiton	Learn from vendor	User awareness Demo	Focus on key business scanarios
Share template of role to regions	UAT from domain experts	Consultant use easy ways	Standeraize your AS IS	Right timing
POC'sat every reigon	Involve carrier oriantated	Effective training to end users	Standerize the manual processes	Optimize processes
Team member NOT part-timer	Establisht ERP control wing	Expert master trainer	Customization only if necessary	Hiring of change management consultant
Evaluate Consultant	IT subdivision of finance	Cooperation from the rigional teams	Empower PM	Technical and psychological preparation
Phase wise implementation	TOT on time	ERP team work as change agent	PM team utilzation	Willingness of people to shift
Learn from failures	Right choice of modules	Effective UAT	Priortize modules	Effective planning
Sufficient Skill set of vendor	Plan who to involve	Business req. followup	Define who to involve in the project	Module according to qualification
Consultant understand processes	Phase-wise implementation	PM relationship & psychology mgt	All stake holder on board	Right choice of module
Vendor not impose TO BE	Develop habit to use the system	PM work as bridge bw vendor & client	Realastic time line	Clarity in objective
Vendor skill set level	Map To BE 100% in system	Quick win approach	Trust consultant	Good techenical infrastructure
TM short trainings by vendor	Document plan and stick to it	Gather requirement properly	Avoid restructuring	Minimize customization

Figure 1: Themes Extracted from the Textual Data

3.1) Tree Map Analysis of ERP Implementation Critical Success Factors

In the tree map worth and significance of each themes in the study is shown. These all the themes relates with critical success factors of ERP implementation. Themes that are surrounded in the big region are more critical as compared to the themes found in the small region of the tree map. Motivate people; Training, Clarity in objective, Effective planning and Good leadership etc. are the significant factors during ERP implementation process. The factors in the end boxes are less critical for ERP implementation.

Figure 2: Word Tree Map

Figure 3: The Model for Critical Success Factors

Word frequency query has also been used using Funneling technique, the model is developed that contains all the factors as shown in Fig-3.

3.2) Text Search Query Analysis of ERP Implementation Critical Success Factors

Text search query has been used in NVIVO to know all occurrences of a word, phrase, or concept used in the interview process to identify CSF and analyze data with a different angle as shown in Figure 4.
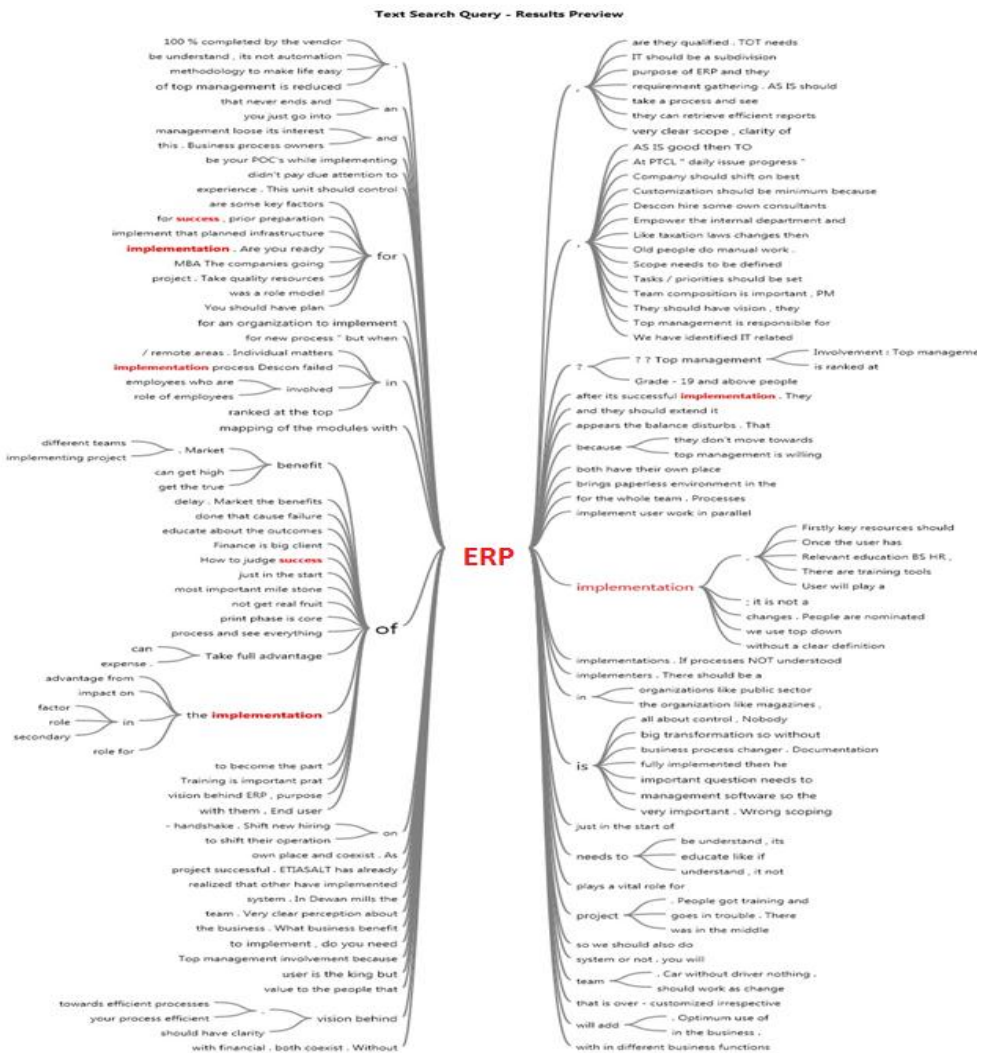

Figure 4: Text Search Query

Text search query for all other six major factors has been used, finally, the Critical Factors obtained from both literature and interviews were mapped. This resulted into 60 Critical Factors that has been classified into 6-groups based on the frequency of occurrence, personal judgement and expert opinion. The main factors are Top Management Involvement and Support, Project Management, Change Management, Education and Training, Business Process Re-Engineering and Vendor Management. The detail of the main factors along with the detail attributes is shown in Table-2:

Table 2: ERP Implementation CSF along with the respective Attributes

Factors	Attributes
Top Management Commitment	1. Realistic time line of ERP Projects
	2. Timing for Implementations
	3. Sustained Top management involvement & support
	4. Empowered Project manager for decision making
	5. Involvement of Business process owners with key role and responsibilities to feel ownership
	6. Appropriate end user identification with key role and responsibilities
	7. Adequate ERP implementation strategy & clarity of vision
	8. Interdepartmental cooperation and support
	9. Strong Project funding
	10. Better technology infrastructure with high speed internet
	11. Dedicated & balanced team of skilled resources for ERP implementation
	12. Timely decisions by leadership
	13. ERP Readiness
	14. Trust building and job surety to end users
	15. Influential champion and change agent
	16. Rewards & Punishments linked with performance
	17. Concern resource availability at multisite
	18. Top Management aligned business strategy with IT strategy
	19. Great ERP software selected aligned with the business needs

Factors	Attributes
Project Management	20. Good project Scope management/Clearly defined and controlled scope and changes in the scope of project assessed based on the additional time and cost it would entail
	21. Motivation & Team work
	22. Risk management
	23. ERP project Team composition & Competence(cross functional, mix of consultant & internal staff)
	24. Module integration management
	25. Good & Formalized project plan
	26. Project Management with realistic milestone & end-dates
	27. Task prioritization
	28. Project manager monitoring & control with daily-log meetings/Follow up
	29. PM maintain moral & momentum of team
	30. Relationship & psychology management by project manager
	31. Good performance measurement & Quality management system
	32. Data collection & migration Strategy for accurate data
	33. Quick win approach to keep people on board
	34. Time management & budget management/Realistic budget
Change Management	35. Engage business process owners in project Technically and Psychologically
	36. Change management
	37. Top management enforcement to use new system
	38. Actual Users involvement & participation
	39. Strong Interdepartmental communication/Strong communication Inward & Outward
	40. Awareness & marketing of product
	41. Knowledge sharing culture
	42. Remove Fears with regards to using the system
	43. Remove Fears with regards loss of job & authorities
Business Process Reengineering	44. Adequate legacy system knowledge
	45. Clarity in key system requirement & design/specification
	46. Minimal Customization

Factors	Attributes
	47. Involvement of domain expert having business & technical knowledge in Business requirement & system design
	48. Meaningful Business Process Reengineering aligning the business processes with s/w
	49. Effective user acceptance testing by domain expert
	50. Resolve module integration issues
Training and Education	51. Formal and effective education & training program to users about new business processes, expectations and the new ERP software?
	52. Right identification of Master trainer & trainees
	53. End user awareness & trust building
	54. No restructuring & Transfer-posting of trained resources/no replacement
Vendor Management	55. Consultant & Vendor Support
	56. Partnership with vendor
	57. Adequate S/W configuration, development & Testing & change management
	58. Project manager Conflict management
	59. Appropriate usage of vendor/consultant
	60. Seasoned Consultant having skill in functional, technical & interpersonal

4) CONCLUSION AND DISCUSSIONS

ERP implementation is not a by-the-way project. ERP implementation is a journey and not the final destination and hence an implementation strategy must be selected according to the needs of the particular industry and not just showing to the world. Understanding and selecting the best practice out of the available huge strategies for implementation the ERP software is very difficult. ERP 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 for the organization's information-processing needs". It can be concluded from the research and literature that the success of ERPs to a great extent depends on the way it has been implemented in the organization. A Well planned and a well-defined strategy at the beginning of the implementation is very crucial in determining the success of the outcomes at the end of implementation. An ERP implementation (transition) strategy

determines how the organization will be moved from legacy system to the new ERP system. From the extensive literature review and rigorous interview process 60 critical factors have been identified divided into six main areas i.e. Top Management Commitment, Effective Project Management, Change Management, Business Process Reengineering, Education and Training and Vendor Management. All these six areas have their related attributes that will provide guide line for the implementation of ERP.

5) RECOMMENDATIONS

Based on the comprehensive literature review and semi-structure interviews the study provides different recommendations to the consultants, vendors and recipient client organizations willing to improve Quality of ERP implementation.

a) **Top Management Commitment:** Top management commitment is primary part of the strategy for successful implementation of ERP. Choosing the right timing for ERP implementation, appropriate ERP package and then right vendor to implement that package is important. Define scope and set realistic time line of the project, involve business process owner and influential champions in the project and map their KPI according to the project needs. Provide all the required resource and monitor the project performance. Top management should have clarity in vision and has strategy to transform that vision into reality. Transfer the objective of the project to the team going to implement ERP including vendor and client. Provide some initial training to the people to be involved in the project and define the JD's and KPI according to new assignments.

b) **Project Management:** There should be a comprehensive project plan and that plans should be followed with set priorities. PM needs to manage the scope of the project with respect to the available timeline, budget constraint and maintains momentum of the project accordingly. PM should build a strong team of capable and skilled people according to the project needs. It is also the responsibility of the PM to motivate people involving in the project and empower them. PM should deliberate authority at lower level that will bring betterment in work, and manage external pressure. Implemented

functionalities should be thorough tested and avoid running legacy system in parallel. PM needs to manage relationship among process owners, implementation partner, his team and higher management, users. Data collection is an important activity and there should be a comprehensive data gathering plan like data going in SAP and coming out needs to be monitored. There should be proper follow up of all business requirement and the defined requirements should be mapped into the system. Quality checks on completion of milestones/deliverables are the symptom of good project management and user acceptance testing should be ensured. Backup plan for knowledge transfer incase a resource leaves the organization plays important role. There should be a lesson learnt report that will be really helpful for the future projects.

c)   **Change Management:** Top management and project manager needs to play the role in removing fears among users about new system. There should be demos and awareness workshops to motivate and give awareness to people about the new system. The organizations in Pakistan need to hire change management consultant because due to low education level high resistance of people appeared. Effective communication among different teams needs to be ensured. Establish department like Organization Change Management (OCM) that can play a vital role for the successful implementation of ERP. Team leads should help to develop people habit to use new system. A prototype can be developed to give an overview of the new system to the people and market about its benefits.

d)   **Business Process Reengineering:** Better AS-IS process will result into better TO-BE. Document the key business scenarios to avoid surprises. Organization in Pakistan seems to avoid change their processes, the study recommend to minimize customization and go for standardization. Adopt best practices and leave legacy system. Finalize TO-BE processes by domain expert committee. Resolve module integration issues. Sharing of business blue print with all teams to avoid integration issues. Integration point should be numbered and maintained by PMO/QA. Experts from vendor should propose solution about the integration points. Monitor process change areas. Review critically these change area while defining TO BE processes. Proper Requirement gathering is very important. Go for customization if necessary. Focus on core business functions and then module selection should be made.

Work on low risk and high value item first. Customization of Taxation Laws is no way to escape. Domain expert should be part of UAT.

e) **Training and Education:** Training should be provided in all the phases of ERP implementation life cycle. There should be different programs for training like train the trainer program, Computer based trainings (CBT's) etc. Appropriate trainers and trainees should be identified. Management needs to create learning environment so that people can get more awareness about the new system.

f) **Vendor Management:** Vendor plays important role for ERP implementation success, so choosing the appropriate vendor majorly contribute in the project success. Client organization needs to higher experienced seasoned consultant. Timely involvement of vendor and consultant brings positively for the success of project. Client team members should win loyalty of vendor and have trust to get benefit from their skills, learn things and improve the skill levels to eliminate their dependencies.

6) FUTURE WORK

- This research study deals with the ERP implementation stage only. Pre-implementation and post-implementation can also be covered in future.
- This study is scope is limited SAP only; similar type of study can be carried out for other vendors like PeopleSoft, Jd-Edward Oracle etc.

REFERENCES

Thomas H. Davenport (1998), "Putting the enterprise into enterprise system," HARVERD BUSINESS REVIEW *JULY-AUGUST.

Boo Young Chung (2007), "An analysis of success and failure factors for ERP systems in Engineering and construction firms" Ph.D thesis.

Al-Mashari (2002), "Enterprise resource planning (ERP) systems: a research agenda", Industrial Management & Data System, 165-170.

Amin Amid, Morteza Moalagh, AhadZareRavasan (2012)," Identification and classification of ERP critical failure factors in Iranian industries", Information Systems 37, pp. 227–237

Majed Al-Mashari (2003), "A Process Change-Oriented Model for ERP Application", International Journal of Human- computer interaction, pp. 39–55.

Gholamhosein Nikookar (2010), "Competitive advantage of enterprise resource planning vendors in Iran", Information Systems 35, pp. 271–277, 2010

J. F. Rockhart (1979), "Critical Success Factors," Harvard Business Review, March-April: 81-91.

Saquib Anwar and Rubana Mohsin (2011), "ERP Project Management in Public Sector – Key Issues and Strategies", Proceedings of the 44th Hawaii International Conference on System Sciences.

Zhe Zhang (2005), "A framework of ERP systems implementation success in China: An empirical study", Int. J. Production Economics 98, pp. 56–80.

Suraj Kumar Mukti (2013), "A Framework for Investigating the ERP System Quality from Users Point of View in Indian Industries", Journal of Economics, Business and Management, Vol. 1, No. 4.

P.T. Kale, S.S. Banwait and S.C. Laroiya (2010), "Performance evaluation of ERP implementation in Indian SMEs", Journal of Manufacturing Technology Management, Vol. 21 No. 6, pp. 758-780.

Jamie Y.T. Chang (2013), "Controlling ERP consultants: Client and Provider practices", The journal of systems and software 86, 1453-1461.

Shang, Shari and Seddon, Peter B. (2000), "A Comprehensive Framework for Classifying the Benefits of ERP Systems", Proceedings Paper 39. http://aisel.aisnet.org/amcis2000/39, AMCIS 2000.

Wen-Hsien Tsai (2013), The Relationship between Critical Quality Factors and ERP System Success - A view of internal/External IT Governance Achievement.

Rothenberger, M.A. (2009), "An Investigation of Customization in ERP System Implementations", Engineering Management, IEEE Transactions on, Volume 56, Issue: 4.

Zainal Arifin Hasibuan and Gede Rasben Dantes (2012), "Priority of Key Success Factors (KSFS) on ERP system Implementation life cycle", Journal of Enterprise Resource Planning Studies, 15 pages, http://www.ibimapublishing.com/journals/JERPS/jerps.html, Vol. 2012, Article ID 122627.

Jayantha Rajapakse and Peter B. Seddon (2005), "Why ERP may not be Suitable for Organizations in Developing Countries in Asia".

E. Umble, R. Haft, M. Umble (2003), "Enterprise resource planning: implementation procedures and critical success factors", European Journal of Operational Research 146(2), pp. 241–257.

Vidyaranya B. Gargeya, Cydnee Brady (2005), "Success and failure factors of adopting SAP in ERP system implementation", Business Process Management Journal, Vol. 11 Iss: 5 pp. 501 – 516.

Y. Xue (2005), "ERP implementation failures in China: case studies with implications for ERP vendors", International Journal of Production Economics 97 (3), pp. 279–295.

M. Cotteleer (2002), "ERP: Payoffs and Pitfalls. Harvard Business School Working Knowledge".

Ngai, E.W.T., Law, C.C.H. and Wat, F.K.T. (2008), "Examining the critical success factors in the adoption of enterprise resource planning", Computers in Industry, Vol. 59, pp. 548-64.

Panorama Consulting Solutions (2014), "2014 ERP Report A Panorama Consulting Solutions Research Report", available at: http://Panorama-Consulting.com/resource-center/2014-erp-report.

N. K. Denzin and Y. S. Lincoln (2011), "The Sage Handbook of Qualitative Research", 3rd Edition, Thousand Oaks, CA: Sage.

Strauss, A. & Corbin, J. (1990), "Basics of Qualitative Research: Grounded Theory Procedures and Techniques". Newbury Park, CA, Sage Publications.

Ann Zhong Liu, Peter B. Seddon (2009), "Understanding how project critical success factors affect organizational benefits from enterprise systems", Business Process Management Journal, Vol. 15 Iss: 5, pp.716 – 743.

Cooke, D., Gelman, L., & Peterson, W. J (2001), "ERP Trends". The Conference Board, pp. 1-28.

Alhojailan, & Ibrahim. M (2012), "Thematic Analysis: A Critical Review of its Process and Evaluation", WEI International European Academic Conference Proceedings.

James Thomas and Angela Harden (2007), "Methods for the thematic synthesis of qualitative research in systematic reviews", Qualitative Health Research 16(1):162-8. http://eppi.ioe.ac.uk/cms/Default.aspx?tabid=188.

Jiwat Ram (2013), "Implementation critical success factors (CSFs) for ERP: Do they contribute to implementation success and post-implementation performance?", Int. J. Production Economics 144, pp.157–174.

Zain, M (1995), "Innovation implementation in Malaysian firms: processes, problems, critical success factors and working climate", Technovation, 15 (6).

P. Soja (2008), "Difficulties in enterprise system implementation in emerging economies: insights from an exploratory study in Poland", Information Technology for Development 14 (1), 31–51.

G. Pan, R. Hackney, S.L. Pan (2008), "Information systems implementation failure: insights from prism", International Journal of Information Management 28 (4), 259–269.