SAP-ERP Implementation: Change Management Model using Qualitative Approach

Muhammad Umar
Dept. of Engineering
Management
Center for Advance Studies
in Engineering
Islamabad-Pakistan

Nawar Khan
Dept. of Engineering
Management
NUST College of EME
Rawalpindi-Pakistan

Mujtaba Hassan Agha
Faculty of Engineering
Capital University of
Science and Technology
Islamabad-Pakistan

Muhammad Abbas
Faculty of Computer
Engineering
NUST College of EME
Rawalpindi-Pakistan

Summary
Research reports provide evidence of high failure rates of Enterprise Resource Planning (ERP) implementation projects in terms of cost overrun, schedule overrun and failure to achieve desired objectives. One of the core identified reason is unwanted attitude from the core business users during the ER-SAP implementation process.
Unlike advanced countries, organizations in developing markets face distinct challenges for standard ERP implementation projects in managing change. A study that may thoroughly articulate critical issues and possible remedies in ER-SAP implementation in managing change is clearly missing in Pakistan's case. And therefore, the aim of the study is to present a model based on market characteristics that can optimistically help the corporate sector in Pakistan while confronting country specific issue in managing change. Qualitative data has been collected using in-depth literature review and semi-structured interview from 20 different organizations of Pakistan.NVIVO-10 software has been used to analyze different themes obtained from the interview. The critical failure factors obtained from literature review and critical success factors obtained interviews were mapped and then finally based on frequency of occurrence of factors and the expert opinion 16-factors have been finalized. This study shall provide valuable guidelines for the recipient client organizations, ERP implementers, vendors and consultants in managing change during ERP implementation projects.
Keywords
Change Management, Critical Factor, ERP Implementation, SAP

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) [1]. 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) [2]. There are various vendors that provide ERP solutions. However, the main vendors are SAP, Microsoft Dynamic, Oracle, JDEdward and People-soft etc. SAP captures the major market share of the world (H.Davenport, 1998) [1]. 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 is considered one of the most important innovations of the past decade (Al-Mashari, 2002) [3].

There are different stakeholders in the ERP implementation project that are difficult to manage due to various incompatibilities. For an effective and efficient ERP solution these incompatibilities needs to be resolved through a comprehensive change management program. The different type of compatibilities is: compatibility between technology (ERP system) and organization (processes), compatibility between technology and users, finally compatibility between organization (processes) and users (Adel M.Aladwani, 2001 [17]. This issue needs to be proactively handled by the top management instead of confronting it reactively. This study will resolve these incompatibilities by managing change for successful ERP-SAP implementation.

Due to these reasons, ERP is 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. To manage change, ERP implementation demands strong commitment by the all the resources from the top management to the lower management (Cooke et al, 2001) [20]. It's a huge transformation that brings tremendous change in all aspects of the organization (Majed, 2003)[5]. 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) [8]. 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) [12][14]. 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) [7]. 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. The study will answer the research question that what are the main critical success factors to manage change in ERP-SAP implementation success.

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) [5]. However, there are various benefits due to which organizations shifts towards ERP like better customer care and retention, improved 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) [19]. It is also important that 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) [10]. 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)[13].
Panorama Consulting Solutions is a well-known consulting group 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) [12]. Such high alarming ERP implementation failure rate got overwhelming attention of researchers. There are different viewpoints about the resistance to change in ERP projects, Egan and Fjermestad has a point of view that resistance is not due to the habit of people or due to any social obligation, mostly it is due to lack of skill or misunderstanding of the change initiated by the organizaiton (Egan and Fjermestad, 2005) [15]. A study conducted by Kotter and Schlesinger, there are foure main reasons for resistance to change, firstly people give priorty to there own interest instead of the the organization interest, not able to understnd the change and its implicaitons, lack of tolerance for change and think that the change is not for the organization(John P. Kotter and Leonard A. Schlesinger, 1979) [16]. For better planning, controlling and decesion making Case Base Reasoning(CBR) can be used that will be help ful to find out the reason due to people resist in adopting change (Se Hun Lim, 2006) [22].
Top management adopt change management strategy keeping in view 3-things, users needs and reaon for resistance, use strategy according to the situation and evaluate status of the change management efforts (Adel M. Aladwani, 2001) [17]. Peter F. Drucker has stated that the main issue to organizational growth is managers' inability to change their behavior and attitudes as speedy as their organizations require (Peter F. Drucker, 1954) [18]. Similerely, different authors have different point of view in managing change in the ERP implementation projects. It is important to assess that which possibility apply affectd by the change, in this way management can take proactive measure to overcome that area to manage resistance. People also resist change when they do not understand its implications and perceive that it might cost them much more than they will gain. It is important to educate people about the change and ensure them that this all is for their betterment. The education process can involve one-on-one discussions, presentations to groups, or memos and reports. If the initiators involve the potential resisters in some aspect of the design and implementation of the change, they can often forestall resistance (Egan.R.W and Fjerme, 2005) [15]. Another way that managers can deal with potential resistance to change is by being supportive. This process might include providing training in new skills, or giving employees time after a demanding period, or simply listening and providing emotional support (Adel M.Aladwani, 2001) [17].

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)[21]. 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) [23]. First of all rigorous in depth literature review has been conducted to identify the critical failure factors regarding change management during ERP implementation process and total 21 critical factors have been identified.

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/themes about the research topic. Convenience sampling technique has been adopted due to its simplicity and nature of the study. 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.

The Tree Map tab displays words as a series of rectangles, where frequently occurring words are in larger rectangle. Using this technique the worth and the significance of each theme can be determined. The tree map given in Figure 1shows different critical success factors for managing change during ERP implementation. Motivate people, training, clarity in objective, effective planning, good technical knowledge, willingness of people to adopt new system, minimize customization are the most critical success factors in the implementation of ERP. Similarly, define objectives, domain expert trainers etc. found as less critical success factor in managing change for the implementation of ERP. The factors that are surrounded in the big region are more critical as compared to the factors found in the small region of the tree map.

Figure 1: Tree Map

Figure 2: Themes Extracted from the Textual Data

Other related document of the project like lesson learned reports are also analyzed to bring more clarity about the critical factors. Total 18 themes have been obtained from the interview process. The critical factors obtained from literature review and critical factors obtained from semi structured interviews are mapped. The mapping of factors based on the frequency and commonality of factors and expert judgement of the focus groups. At the end 16 factors have been finalized that are termed as critical factors for managing change during the process of ERP implementation in the organizations of Pakistan. These finalized factors are shown in the Figure-2 below.

4. Conclusion and Discussions

Organizations are moving towards ERP to gain competitive advantage through bringing effectiveness and efficiency in their processes. It can be concluded from the study that the success of ERP-SAP 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 approach in managing change will determines how the organization will be moved from legacy system to the new ERP system. The result obtained from the study are based on data obtained from the organizations of Pakistan. So these results will also be true in developing country context. The study depicts that most of the critical factors in managing change obtained from the study in Pakistan are also present in the literature. However, there are some additional factors that are exclusively important for the organizations in Pakistan and other developing countries. Like in Pakistani Culture context, top management should enforce people to use new system, fear of people about loss of job and organization readiness are the prominent area that appears in the study.
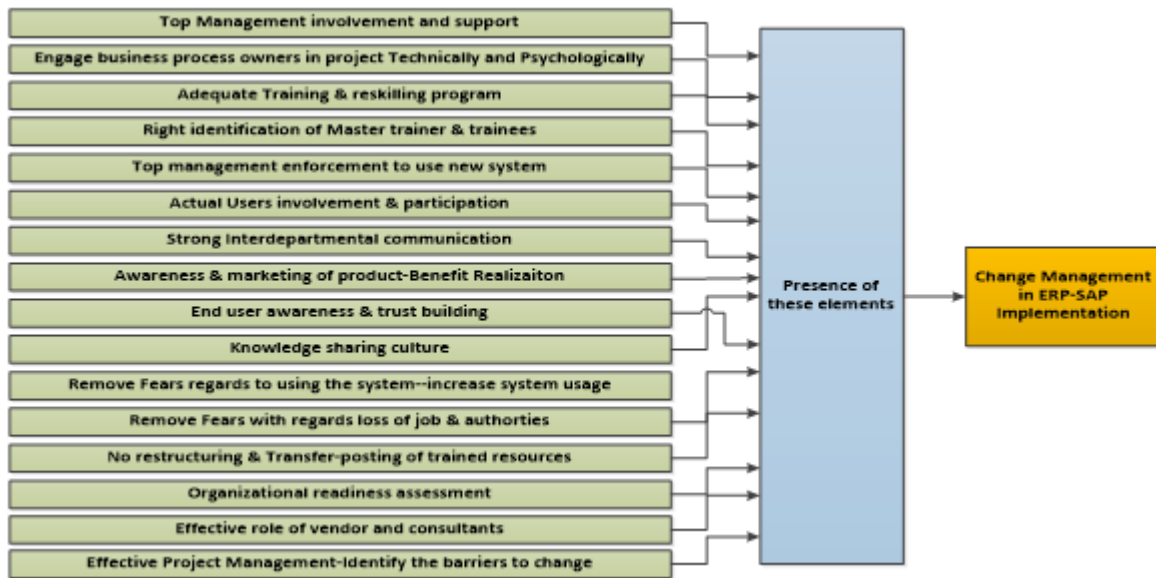
Figure 3: ERP Implementation CSF for Change Management

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 manage change for ERP-SAP implementation projects. New way of doing things will not be deep rooted unless the organizations will not take systematic steps in bringing cultural transformation. As per our research following are the main recommendations that are drawn.

1. Top management and project manager needs to play the role for removing fears among users about the new system. There should be high level demos and awareness workshops to motivate and give awareness to people about the new system. Top management should motivate and then enforce people to leave the legacy and shift on SAP. The organizations in Pakistan need to hire change management consultant because due to low education level high resistance of people appeared.

2. The barriers for change need to be identified, like loss of authority, barriers in training, company politics are few areas. There are some well know individual having good authority, some are politically powerful can facilitate to overcome these barriers. Market benefits of the product engage people technically and psychologically.

3. Effective communication among different teams needs to be ensured. Establish department like Organization Change Management (OCM) that work for managing change. There should be a well-crafted communication plan. Variety of channel and mediums can be used to capture the user attentions.

4. 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.

5. There should be knowledge culture in the organization. Remove fear about using the system. Project manager needs to play effective role and take vendor help where required.

6. Future work

- This research study deals with the ERP implementation stage only. Pre-implementation and post-implementation can also be covered in future for change management program.
- 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
[1] Thomas H.Davenport, "Putting the enterprise into enterprise system," HARVERD BUSINESS REVIEW *JULY-AUGUST 1998
[2] Boo Young Chung, "An analysis of success and failure factors for ERP systems in Engineering and construction firms" Ph.D thesis 2007.
[3] Al-Mashari, "Enterprise resource planning (ERP) systems: a research agenda", Industrial Management & Data System , 165-170, 2002
[4] Amin Amid, Morteza Moalagh, AhadZareRavasan," Identification and classification of ERP critical failure

factors in Iranian industries", Information Systems 37, pp. 227–237, 2012

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

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

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

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

[9] Suraj Kumar Mukti, "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, November 2013.

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

[11] Zainal Arifin Hasibuan and Gede Rasben Dantes, "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, 2012.

[12] Panorama Consulting Solutions,"2014 ERP REPORT A Panorama Consulting Solutions Research Report", available at: http://Panorama-Consulting.com/resource-center/2014-erp-report/, 2014

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

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

[15] Egan.R.W, and Fjermestad, "Change and Resistance help for practationaire of change", in proceedings of the 38th Hawaii international conferaenced of the system sciences, pp 21-226, 2005.

[16] John P. Kotter and Leonard A. Schlesinger, "Choosing Strategies for Change", Harvard Business Review, 1979

[17] Adel M.Aladwani, "Change management stratigies for successful ERP implmentation", Business process management journal, Vol 7, No. 3, 2001, Pp 266-275

[18] Peter F. Drucker, "The Practice of Management", New York: Harper and Row, I954.

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

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

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

[22] Se Hun Lim, "Forecasting of ERP Implementation Using Case-Based Reasoning", IJCSNS International Journal of Computer Science and Network Security, VOL.6 No.4, April 2006.

[23] Strauss, A. & Corbin, J., Basics of Qualitative Research: Grounded Theory Procedures and Techniques. Newbury Park, CA, Sage Publications, 1990

Author profile:

Muhammad Umar is PhD student in Computer Engineering Department in Center for Advance Studies in Engineering. Islamabad, Pakistan. He received his Master degrees in Computer Sciences and Physics from University of the Punjab, Lahore. He possesses versatile experience of more than 10-years in different telecom companies of Pakistan and abroad. He has been involved in the research in the area of Computer Sciences and Information System for the last 5-years. He received various international certifications in SAP-HCM, Oracle, Lean Six-Sigma Black Belt and TOGAF 9.0.

Nawar Khan is a professional Mechanical Engineer and has done PhD under a split PhD program of Ministry of Science and Technology (MoST) from the University of Engineering and Technology Lahore and De Montfort University, Leicestershire UK in August 1999. He has authored more than 90 national/ international research publications and text book on TQM published by NUST. He established the Dept of Engg Management and has served as first Head of Dept. He has also served as Associate Dean, Dean PG Programs and now working as Dir R&D at NUST College of Electrical and Mechanical Rawalpindi Pakistan.

Mujtaba Hassan Agha is PhD Industrial Engineering-France and has more than ten years of professional and teaching experience. He has a mechanical Engineering degree from GIK Pakistan and an MS, and PhD from France. This includes five years of professional experience at a leading aviation company in Pakistan and four years of professional experience in Toulouse, France (hub of Airbus industry). He is a certified Supply chain Specialist from APICS USA and has conducted regular professional trainings and consultancies on diverse topics.

Abbas is Assistant Professor in Computer Engineering CE&ME, National University of Sciences and Technology (NUST). He has done his Ph.D. in Information System from, UK. His main area of interest is Enterprise Information systems.