Factors Affecting ERP Implementation Success in Banking Sector of Pakistan

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Abstract
This research paper seeks to investigate the critical success factors of Enterprise Resource Planning (ERP) implementation in banking sector of Pakistan by identifying internal organizational, technological and individual factors from past studies and then determine their significant impact on successful implementation of Enterprise Resource Planning (ERP) in banking sector of Pakistan. IT infrastructure and IT skills belongs to technological factors and self-efficacy, user involvement which belong to individual factor. A theoretical framework has been developed Results of the research show that the instrument is reliable to measure the constructs. Correlation & regression values show that all CSFs have significant impact on success implementation of ERP while only IT infrastructure is less significant as compare to other five CSFs in Pakistan Banking Sector context.

Key Words: Critical Success Factors, Enterprise Resource Planning, Core Team, Self Efficacy, Data Migration, Live Environment.

Introduction
An Enterprise Resource Planning (ERP) is packaged software which is used by many companies to integrate business functions and disseminate ordinary information and processes throughout organization (Seddon et al. 2003). ERP software integrates enterprise-wide information and business activities e.g production, human resource, distribution, sales and marketing. ERP software enables the company to manage its resources efficiently and effectively. ERP gained popularity in early 1990s and became one of the best software to manage business processes (Holland & Light, 1999).

The key suppliers of ERP are SAP, Oracle & Microsoft. ERP systems are adopted by many companies to gain competitive advantage. Considerable benefits of ERP include the minimum operating & maintenance cost, enhanced customer services, improved production schedule etc. ERP implementation is time taking and costly as well. Once ERP deployed then to revert back is not possible. Hence ERP implementation is difficult and tends to be managed vigilantly to gain all benefits (Bingi et al.,1999).

Critical Success Factors are the key area where satisfactory results can give the business competitive edge (Rockart, 1979). In order to get desired output, company must exert efforts to its fullest (Pinto & Slevin, 1987) Dadashzadeh (1989) defines CSF as the important aspects which a manager should highlight as their objectives and then a certain criteria must be set to attain these objectives. The core fundamentals of ERP deployments includes the basic transaction procedures and applications to support the centralized database.
which can be designed by the organization or the vendor and some other tools which are necessary for the smooth working of ERP.

Success of the ERP implementation is very critical because ERP system is very costly and expensive especially for the large scale organization. The requirement of ERP system includes proper hardware gadgets, connectivity media and other power backup resources. Initially ERP system was designed for the manufacturing industries and financial sector, now it becomes the need for all other sector as well due to advanced features added up in this system (Markus and Tanis, 2000). In other case, if the ERP system has not been implemented successfully, the heavy cost which the organization spend to modify the whole infrastructure becomes useless.

Research Problem

Jamil and Ijaz (2007) mentioned in research work that ERP is a most highly technological and complex software package offer to different buyers in several sectors of economy to centralized the database in real time working. A number of top information technology companies in Pakistan are giving the ERP software solution to large and medium business enterprises. During the study, researchers also highlighted ERP implementation in telecom sector and Oil and Gas sector which are automating the systems for efficient working. Mostly studies to identify significant factors in the successful completion of ERP system have been conducted in developed countries, while not much research has been done in under developed countries. As Pakistan economy is growing and volumes of organizations increasing rapidly. Especially financial sector in Pakistan is flourishing day by day. Financial sector in Pakistan includes banks, fund based institution, and non fund based institution, microfinance and other financial institution to develop particular business or sector. No formal research has been conducted to find out the vital success factors in the completion of ERP project. This study will bridge the gap to find out critical success factors in organizational, technological and individual prospective in context of banking sector of Pakistan.

Research Objectives

- To identify critical success factors of ERP implementation in banking sector of Pakistan
- To find the impact of critical success factors for the successful implementation of ERP in banking sector of Pakistan
- To provide the possible recommendations.

Literature Review

Manufacturing Resource Planning systems are basically parent software of ERP in 1960s but these are based on manufacturing business, while ERP software provide complete solution to the corporate sector by integrating all functions including production, planning, finance, sales and admin (Markus, Tanis, & Fenema, 2000) (Vogt, 2002). The growth in Manufacturing Resource Planning systems were made with the passage of time and it integrate some more functions (Wallace & Kremzar, 2001).

(Wallace & Kremzar, 2001) MRP has ability to schedule the production as per inventory requirements (Oden, Langenwalter, & Lucier, 1993) (Ptak & Schragenheim, 2000) These early systems have certain limitation to process data (Klaus, Rosemann, & Gable, 2000). MRP II were enhanced to perform tasks effectively in integrated environment (Klaus, Rosemann, & Gable, 2000) (Rashid, Hossain, & Patrick, 2002). In 1990’s, MRP II stretched to integrate all functions of organization which then term into enterprise resource planning as all department of a company are inter connected in this system And ERP has advantage to use in any corporate sector, rather services, or (Ptak & Schragenheim, 2000) . There are two important factors for ERP implementation, tactical and strategic. The tactical factors include client consultation, software customization, reviewing procedures at regular intervals, strong communication
Meanwhile strategic factors take account of planning, management support, vision (Holland & Light 1999). Shankarnarayanan (1999) suggested following criterion for evaluation of enterprise system e.g functionally match with business processes, collaboration between different ERP system’s components, flexibility, complexity, rapid implementation, technology (server capability, database, independence, and security), availability of customization required, local support infrastructure, total cost e.g implementation cost, license and training cost. Umble (2003) identified following CSF for ERP implementation; top management commitment, efficient project management, change management at organizational level, implementing execution team, intensive training.

Nah (2001) recognized certain factors which were fundamental for ERP implementation like management commitment, team building, organizational vision, champion of product. Gargeya & Brady (2005) put forward following CSFs for the implementation of ERP like testing, budgeting and extensive training.

Ahmed & Khan (2013) conducted their study in Indian context. They highlights the importance of ERP by mentioning that from past few years ERPs have become important for all types of business enterprises. In corporate sector, the companies required to utilize the operations smoothly and effectively to survive in competitive environment. ERP software provides best solution to this issue and keeps the organization in the market and keeps all operation efficient. It provide real time information and helps in decision making by top and middle level management and keep update all databases so that update information can be access any time. But to achieve the benefits ERP must be implementing successfully and each factor should be handle minutely to mitigate the risks. In this study they took the case study of three organizations and provide the information that early identification of CSFs are vital to avoid any failure of ERP. They presented the CSF in general so that it becomes helpful for any type of industry. They conclude in their paper that ERP is complex software package to provide end to end help to the business enterprises and it main purpose to support all department by integrated all business activities. In early stages ERP implementation required lot of man power and resources due to its complex nature and specialized skills to deploy in any organization. But with the passage of time many studies have been done and certain skills have been obtained through experience which lessen the risks and increase the chances of success. The authors make three categories to identify the CSFs, pre, During, and post implementation phase and compare organization case study approach, and they found the management commitment and team efforts were very vital in pre implementation phase training of users and data migration were found CSFS of during implementation phase, while in the post implementation phase authors found that top management commitment is again very vital for the success of ERP implementation.

Schniederjans & Yadav (2013) stated in their research a model that improved elaboration of critical success factors to ERP implementation mapping with the knowledge, business and surroundings architecture. The paper also made addition to existing literature the crucial factor of confidence in vendor, software and specialist which has mostly not mentioned in the earlier studies. Authors critically analyzed past literature derive a new conceptual model that contains critical success factors that have been empirically tested to ERP implementation success. In this study authors criticize the Past studies having lengthy list of Critical factors and development in ERP mentioning it as laundry list rather empirically test the CSFs effect with each other for the flourishing completion of ERP project (Akkermans & Van Helden, 2002). They use the holistic approach to develop a conceptual model for ERP implementation success and to form the subset of critical factors which are vital for success and reduce failure rates. During ERP implementation the issues of reductionism have also been mentioned by (Motwani, Subramanian, & Gopalakrishna, 2005) considering the criticisms and important literature, provide a model of ERP completion. Theoretical foundations and deep insights to ERP implementation has been provided in this paper by mentioning the organization culture and other outside pressure while implementing ERP. Most significant insights in this research is the importance of trust in the ERP society, that exists among business departments implementing ERP, vendors, Core team and trust that exists regarding the procedure itself. Agbada & Osuji (2013) encourage further progress through empirical work using the model in future studies.

**Theoretical Framework**

By reviewing the past literature, important factors have been identified which have significant impact on successful implementation of ERP. On the basis of the previous studies a conceptual model has been developed. Hypothesis are also formulated with descriptions.

![Conceptual Framework](image)

**Figure 1. Theoretical Framework**

Conceptual framework is depicted by three independent variables, Internal Organizational factors, Technological factors, and Individual factors and Successful Implementation of ERP working as dependent variable. Arrow stemming out from independents variables toward dependent variable shows that Critical factors are affecting the successful implementation of ERP.

**Hypothesis**

Bradford (2000) described that one organizational factor “top management support” is key factor in elaborating ERP implementation success.

H1: Management Commitment has significant and direct relationship with Successful Implementation of ERP in Banking Sector of Pakistan

Training is that the end users fully get the knowledge of interface and module for smooth working (Al-Mashari et al, 2003).

H2: Training & Education has significant and direct relationship with Successful Implementation of ERP in Banking Sector of Pakistan

IT infrastructure must be suitable and compatible with the ERP software being implemented (Nah & Lau, 2001).
H3: IT Infrastructure has significant and direct relationship with successful implementation of ERP in Banking Sector of Pakistan.

IT skills play important role in success of ERP implementation (Brown, 2001).

H4: IT Skills has significant and direct relationship with successful implementation of ERP in Banking Sector of Pakistan.

Self-efficacy can be increased and user is confident enough to meet the new challenges (Umble, Haft, & Umble, 2003).

H5: Self Efficacy has significant and direct relationship with successful implementation of ERP in banking sector of Pakistan.

User involvement is very important as he should be guided accurately so that implementation of ERP become successful (Brown & Jennifer, 2001).

H6: User Involvement has significant and direct relationship with Successful Implementation of ERP in Banking Sector of Pakistan.

Methodology

Banking sector of Pakistan selected as target population and the banks selected for target population are those where ERP has been fully implemented and all modules have been working, due to time and financial constraints top three banks of central II Region of Punjab are selected and these are chosen due to working on completely installed ERP software and having high number of branches, having high deposit volume, having more staff strength, all banking operations are automated, 24/7 online banking and having internet banking facility (Hafeez, 2000) These three banks are United Bank Limited, Allied Bank limited, Bank Alfalah. Thousand banks staff were taken as target population. Target population consist of Top Management, Middle Management, Core Team, facilitators and IT staff. There are certain other banks having ERP installed working in Pakistan but due to there low volume, less number of branches and new to banking industry are not considered for this study. Sample population was 300. Random Sampling Technique is used because every staff member including Top and Middle Management from sample population of three hundred has equal chance to fill the survey form. For data analysis Nvivo version 9 software was used because it is one of the trustworthy software to analyze qualitative data. Different techniques are used to analyze data like thematic analysis, discourse and conversational analysis, content analysis, cluster analysis, word frequency analysis.

Data Collection

For data collection adopted self-administered questionnaire was used (Jiang, 2005; Umble, 2003; Moheebat et al., 2010). Total 300 questionnaires were distributed in twenty Regional offices, five group offices and three Head offices and two hundred branches. 135 completed questionnaires were received which show the Return rate was 45% of sample. Reliability of questionnaire was checked through cronbach’s alpha value, while questionnaire is valid as adapted from past literature which already tested in other context.

Data Analysis Method

For data collection SPSS 17 v was used. To find the impact of newly explored critical factors on ERP successful implementation directional hypothesis were developed. Correlation and regression analysis was run on data (Creswell, 2008).
Findings

Reliability Analysis

Table 1 shows the values of Chronbach’s coefficient $\alpha$ for the constructs used in this research. Reliability of questionnaire was checked through Cronbach alpha. Chronbach alpha is a statistical tool used to determine the internal consistency of any construct. Each variable has coefficient alpha greater than .5 which is considered acceptable in research.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Items</th>
<th>$\alpha$-Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management Commitment</td>
<td>4</td>
<td>.642</td>
</tr>
<tr>
<td>Training and Education</td>
<td>4</td>
<td>.725</td>
</tr>
<tr>
<td>IT Infrastructure</td>
<td>4</td>
<td>.776</td>
</tr>
<tr>
<td>IT Skills</td>
<td>4</td>
<td>.668</td>
</tr>
<tr>
<td>Self Efficacy</td>
<td>4</td>
<td>.755</td>
</tr>
<tr>
<td>User Involvement</td>
<td>4</td>
<td>.661</td>
</tr>
<tr>
<td>ERP implementation</td>
<td>5</td>
<td>.589</td>
</tr>
</tbody>
</table>

Correlation Analysis

Correlation analysis depicts strength of relationship among the variables. Correlation value moves from -1 to +1. If value is greater than 0.5 it means positive strong correlation exist among the variables. Table 5.2 shows that

<table>
<thead>
<tr>
<th>Variables</th>
<th>Training and Education</th>
<th>IT Infrastructure</th>
<th>IT Skills</th>
<th>Self Efficacy</th>
<th>User Involvement</th>
<th>Successful ERP implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management Commitment</td>
<td>.207*</td>
<td>.169*</td>
<td>.493**</td>
<td>.104</td>
<td>.628**</td>
<td>.838**</td>
</tr>
<tr>
<td></td>
<td>.016</td>
<td>.050</td>
<td>.000</td>
<td>.230</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td>Training and Education</td>
<td>.010</td>
<td>.801**</td>
<td>.167</td>
<td>.214*</td>
<td>.345**</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>.905</td>
<td>.000</td>
<td>.053</td>
<td>.013</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>IT Infrastructure</td>
<td>.034</td>
<td>-.005</td>
<td>.076</td>
<td>.138</td>
<td>.111</td>
<td></td>
</tr>
<tr>
<td></td>
<td>.693</td>
<td>.954</td>
<td>.382</td>
<td>.111</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>IT Skills</td>
<td>.203*</td>
<td>.485**</td>
<td>.646**</td>
<td>.018</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.099</td>
<td>.224**</td>
<td>.009</td>
</tr>
<tr>
<td>Self Efficacy</td>
<td></td>
<td></td>
<td></td>
<td>.256</td>
<td>.733**</td>
<td></td>
</tr>
<tr>
<td>User Involvement</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.000</td>
</tr>
</tbody>
</table>
Above table showed that r value between Management Commitment and ERP Successful Implementation is 0.838 which is significant at 0.00 level < p-value (0.05). It means positive and strong correlation exists among Management Commitment and ERP Successful Implementation. Training and Education’s correlation value is 0.345 which is significant at .000 level < p-value (0.05). It means positive but week correlation exists among Training & Education and ERP Successful Implementation. Correlation value for IT infrastructure is .138 with significant value .135 > .05 p –value which shows no strong correlation between IT infrastructure and ERP Successful Implementation. IT Skills correlation value is .646 significant at .000 <0.05 p-value which shows that positive and strong correlation exists among IT Skills and ERP Successful Implementation. Correlation value for self efficacy is .229 significant at .009 level < .05 p value. It depicts that positive but week correlation exists between Self Efficacy and ERP Successful Implementation. Correlation value for user involvement is .733 significant at .000 level less than .05 p -value. It describes positive and strong correlation exist between User Involvement and ERP Successful Implementation.

Regression Analysis

Here multiple regression analysis was used to show the impact of predictors upon criterion variable. Above table shows that Management Commitment has significant relationship with ERP Successful Implementation as beta shows β=.617, t = 10.99 with P = .000 < 0.05 p-value. So H1=Management Commitment has significant and direct significant relationship with ERP successful Implementation is accepted. It shows that if one unit change occurs in Management Commitment variable it will change the dependent variable 61.7 %. For Training & Education beta value is .104, with t –value 2.637 ,P=.009 < 0.05 p-value. So H2=Training & Education has significant and direct relationship with ERP Successful Implementation is accepted. It shows that as one unit change occurs in Training & Education variable it will change the dependent variable 10.4 %. For IT Infrastructure beta value is 0.019 with t –value .511 is not significant because P = 0.610 > 0.05 p-value. So H3= IT Infrastructure has significant and direct relationship with ERP Successful Implementation is rejected. Beta value for IT Skill is .261 with t- value 4.58, P =.000<( p value=.05).

Table 3: Coefficient of Regression

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>Collinearity Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>-1.608</td>
<td>.295</td>
<td>-5.443</td>
</tr>
<tr>
<td>Management commitment</td>
<td>.617</td>
<td>.056</td>
<td>.539</td>
</tr>
<tr>
<td>Training and Education</td>
<td>.104</td>
<td>.040</td>
<td>.101</td>
</tr>
<tr>
<td>IT infrastructure</td>
<td>.019</td>
<td>.037</td>
<td>.019</td>
</tr>
<tr>
<td>IT Skills</td>
<td>.261</td>
<td>.057</td>
<td>.204</td>
</tr>
<tr>
<td>Self Efficacy</td>
<td>.084</td>
<td>.037</td>
<td>.084</td>
</tr>
<tr>
<td>User Involvement</td>
<td>.323</td>
<td>.059</td>
<td>.264</td>
</tr>
</tbody>
</table>

So H4= IT Skills has significant and direct relationship with ERP Successful Implementation is accepted. It shows that as one unit change occurs in IT Skills variable it will change the dependent variable 26.1 %. For Self Efficacy β = 0.084,t = 2.249 is significant at .026 < ( p=.05). So H5= Self Efficacy has significant and direct relationship with ERP Successful Implementation is accepted. It shows that as one unit change occurs Self Efficacy variable it will change the dependent variable 2.6 %. For User Involvement β = 0.383,t = 5.480 is significant at .000 < (p value=.05).
So H6= User Involvement has significant and direct relationship with ERP Successful Implementation is accepted. It shows that as one unit change occurs in User Involvement variable it will change the dependent variable 38 %. Variance inflation factor values less than 5 which show no multicollinearity exist in data.

### Table 4: Model Summary

<table>
<thead>
<tr>
<th>R</th>
<th>R Square</th>
<th>F Change</th>
<th>Sig.</th>
<th>Durbin Watson</th>
</tr>
</thead>
<tbody>
<tr>
<td>.913</td>
<td>.833</td>
<td>106.17</td>
<td>.000</td>
<td>2.10</td>
</tr>
</tbody>
</table>

- a. Predictors (Constant), Management Commitment, Education & Training, IT Infrastructure, IT Skills, Self Efficacy and User Involvement.
- b. Dependent Variable: ERP successful Implementation

Table 4 shows that R-value =.833 is significant at .000 level < 0.05 p-value. It means if one unit change is occur in independent variables then it will change the dependent variable 83.5 %. F-value = 106 is also significant at .000 level < (p-value =.05). It means model is fit. Value of Durbin Watson is 2.10 which shows that no auto correlation exist among the variable.

### Conclusions and Discussion

This study makes use of previous literature identify critical success factors in ERP implementation and then generalize the identified CSFs on target population and find that Management Commitment, Education & Training, IT skills, User Involvement and Self Efficacy to find the impact on success of ERP implementation in Banking Sector of Pakistan. It is clear an efficient ERP solution gives competitive edge to any organization. Top management commitment acts as catalyst in the progress of ERP implementation, Management active role keep the progress at pace and involve all team members. Supportive policies are crucial for the achievement of implementation (Jiang, 2005). Management reviews help to keep the implementation working on track and align to the objectives of organization. Management liaison with vendor is necessary to update the progress with new inventions in the system. Education and Training has strong impact on the successful implementation of ERP in Banking Sector of Pakistan because users in Banking Sector are mostly not well trained with the IT knowledge and need proper training to fully utilize the functionality of ERP, users complete understanding can bring fruitful result to the organization. Certain hand on practice and sessions, on job training arrangement can reduce the failure chance of ERP and it can be implemented successfully. IT infrastructure in Pakistan banking sector considered as compulsory arrangement with the implementation of ERP so IT gadgets are usually upgraded with ERP implementation, mostly ERP vendors provide combine hardware and software solution (DeLone & McLean, 1992) so that there is no compatibility issue while working in ERP. IT skills plays vital factor in reducing the failure risk of ERP in banking sector as core team must be competent enough to migrate data successfully, because accurate data is main core element of ERP success, if there is issue in data migration then there will be synchronization issue and data queries will bring garbage results which can affect the organization performance as well as reputation (Nah & Lau, 2001). Self efficacy is the most important element in ERP implementation in organization as user confident and willingness to accept the change and ability to perform in the hard trainings and remain calm during odd situation or malfunctioning of system. User involvement and active participation during all phases of ERP implementation bring the procedure more easy and successful because user lack of interest and passive can increase failure rate (Jiang, 2005).

### Recommendations

On the basis of above discussion this study is provide the following recommendation to banking sector of Pakistan.
Practitioners Perspective

- Smooth migration process
- Guides to eradicate impediments during implementation phase
- Helps to mitigate ERP implementation failure risks
- Offers the strategy way out to obtain competitive advantage
- **Management Commitment** is the essential factor successful implementation of ERP. Senior officers of banking sector should actively participate in overall implementation phases, measurable objectives and quality policies must be established and share it with all staff and technical team by doing this organization can assist the internal employees goal setting and build strong mechanism for sucessful ERP implmenation.
- **Quality Education and Training** also very critical. This study suggests that management should provide learning environment that assist to build quality educated culture. Training sessions arrangement and continuous education at regular intervals can enhanace the success chances of ERP implementation in Banking Sector. Proper training sessions should be arranged at regional office level so that end users can get best hands on practice and equipped with latest knowledge about the ERP modules .This study suggests that companies should establish an integrated education training department to guide users about ERP and some mobile teams must be there who educate users at branch level.
- Banking Sector should strenthen the **IT Skills** of their Core Team Department. In fact Core Team are actually take part in implementation ERP system and considered critical in success of ERP system.
- **User Involvement and Self Efficacy** should be increased by proper startegies so that end user should remain motivated and confident about the change and always actively participate in the whole implementation process and give extra time for understanding the modules of ERP . Coaching sessions should be arranged so that users could be guided about their roles and benefits regarding ERP implementation, rather resisting the change , user think himself as important player in ERP implementation and reduce the chances of failure of ERP in Banking Sector of Pakistan.

Academia Perspective

- Provide layout for future research using mixed Method approach.
- Assist to carry the research in other non financial sectors.

Limitations and Future Research Directions

- In this study only Banking Sector of Pakistan is conisdered and target population central II, Punjab banks were taken for data collection where ERP has been implemented successfully and their all banking operations are fully automized. In future same research can be conducted in other non financial sectors of Pakistan by collecting the data from both financial organizations and non financial companies of Pakistan.It will also assist to identify CSF in other corporate sectors in Pakistan.
- Due to time and financial constraints target population of thousand bank staff and sample poulation of three hundered from banking sector have been taken in future study large sample size can be considered for more precise results.

References


