

## Role of Education and Training in the Successful Implementation of Business Process Reengineering: A case of Public Sector of Khyber PakhtunKhwa (KPK)

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*This study investigates the role of education & training in the successful implementation of business process reengineering (BPR). Study is conducted on the departments / organizations of public sector of Khyber PakhtunKhwa (KPK) that are undergone through reengineering process till June, 2011. This study is based on the responses from middle and lower management of the sample of two departments among the population with aim to identify the relationship of education & training with the successful implementation of BPR based on self administered questionnaire and sample response of 101 respondents working in the various functional/ operational divisions. The responses were checked for their reliability, using Cronbach's alpha, Pearson correlation and regression tests were adopted for testing the hypothesis. Results showed strong correlation between education and training and successful implementation of BPR. Furthermore, results indicated a positive correlation and impact of independent variables on successful implementation of BPR. Moreover, regression analysis also provided supporting evidence for hypothesis. Thus, the results of this study revealed the strategic importance of education & training and its influence on successful implementation of BPR. It has been estimated that education, training are having positive (significant) relationship with the successful implementation of BPR.*

**Key Words:** Business process reengineering, education, teamwork, training, successful implementation of BPR, public sector

### 1. Introduction

In today's era of globalization and information technology (I.T), Business Process Reengineering (BPR) is playing a vital role in the enhancement of productivity and efficiency of many organizations. A crowd of interrelated tasks that creates value is called a business process. Hewitt (1995), While process is set of logically related tasks performed to attain some defined results as said by Davenport & Short (1990). Hammer (1990), introduced and provided a new soul to the business called business process reengineering (BPR). The appropriate implementation of BPR requires human effort, support of leadership and motivated employees. Otherwise the employees will show

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resistance to change and eventually will feel stressful. BPR is top-down, process driven approach managed by senior executives, which aims to improve the performance by radical changes in the system over short term Ardhaladjian & Fahner (1994).

Khyber PakhtunKhwa (KPK), among one of the important province of Pakistan has contributed to the growth of the country in every possible way and is major electricity producer of Pakistan. Public sector of KPK is bringing radical change in the existent business process to enhance the productivity and reduce the process cost. Directorate of science & technology and information technology (ST&IT) is working for reengineering of the provincial departments (mainly service sector).

BPR requires time and proper paperwork (planning) before introducing this new process otherwise there are great chances of failure. Mashari & Zairi (1999) said that 70% of the BPR fails during the implementation because of lack of planning and proper measures. The causes of failure mainly include not proper implementation and high expectation for BPR.

### **1.1 Research Question**

This study will be focused on finding answers the following questions:

- Is there any significant relationship between education & training and successful implementation of BPR in public sector of KPK?

### **1.2 Objective of the Study**

The study aims at investigating relationship of education & training, and successful implementation of BPR. This study also aims to investigate the level of significance and role of education and training in the implementation of BPR with the aim to fill the gap of existent knowledge in KPK on the subject above. Previous studies were mostly focused on comparison of BPR and TQM (total quality management), comparative analysis of successful and unsuccessfulness of BPR in private sector, identification of critical success factors etc. while this study aims to expend the body of knowledge by testing the HR functions and its impact on contribution towards the improvement of chances of successfully implementation of BPR in public sector organizations.

### **1.3 Significance of Study**

The study is projected to assist demystify the relative importance of organizational workforce and the key necessity of education & training and teamwork in any decision and goals achievement mainly in terms of successful BPR implementation. It is likely to endow with pragmatic support to the assumption that education, training and teamwork are the key for successful implementation of BPR and achievement of organizational goals. The findings at the end of the study may hasten efforts to devote in training and teamwork (HR) at organizations that seeks for radical change through BPR and also for the country as a whole.

### 1.4 Roadmap of Research

In next phase of this study will focus on highlighting previous work done in BPR all across the globe and will strive to identify the gap and later try to fill that gap. Followed by development of hypothesis and research methodology used, later on research findings and analysis will be discussed.

## 2. Review of Literature

A crowd of interrelated tasks that creates value is called a business process. Hewitt (1995) While process is set of logically related tasks performed to attain some defined results Davenport & Short (1990). Hammer & Champy (1993) defined Business process Research (BPR) as *“the fundamental rethinking and radical redesign of business process to achieve dramatic improvement in critical contemporary measures of performance, such as cost, quality, service and speed.”*

Another definition of BPR was from Davenport (1993), *“encompasses the envisioning of new work strategies, the actual process design activity, and the implementation of the change in all its complex technological, human, and organizational dimensions.”*

Hammer (1990) called it BPR (Business Process Re-engineering), Davenport & Short (1990) used BPR (Business Process Redesign), Harrington (1990) used term Business Process Improvement while Business process transformation term was used by Burke & Peppard (1993) etc.

### 2.1 Models and Tools of BPR

From review of literature it has been observed that very few agreed on the use of similar tools and techniques for BPR. But most commonly used tools and techniques are: Process Visualization (define the vision for the process, the reason for change) Barrett (1994), Process Mapping proposed by Cypress (1994), Change management (managing change in terms of workflow, organizational change and the human force) suggested by Kennedy (1994), Benchmarking (being an important factor of BPR for the sake of development and continues improvement) Chang (1994), and Process and customer focus (customer oriented approach and value chain improvement) suggested by Vantrappen (1992). There are five phases of BPR procedure are; Phase 1 (Mission and vision, strategic planning and goals), Phase 2 (defining objectives and principles and identification of opportunities), Phase 3 (elaboration of future perspective i.e. “to be” and “as is” situation), Phase 4 (gap analysis and planning for implementation) and Phase 5, (implementation).

### 2.2 Role of Human Resource in BPR

Human resource plays major role in the success and failure of BPR because HR is a key factor of any organization. While reviewing the available literature on BPR it has been revealed that very few studies are conducted on the role of HRM in BPR success.

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Zucchi & Edwards (2000) conducted study on exploring the attributes of HRM in BPR. Their study was focusing on 11 UK firms' that were undergone or under process of BRP. Findings of their study were; due to BPR organizational structure has changed, role of management increased and are now more accountable as well as process oriented. Furthermore need of new training programs increased, teamwork and training on multi tasking have increased but major part of teams are still untrained. Due to BPR reward systems were revised and changed. Need for training on new structure and managing human resource is vital for any organization. To motivate the employees; they should be rewarded properly. Their study indicates that career paths were also changed due to BPR. Training programs were launched on the bases of multitasking skill development so that team works properly and effectively. Hence it can be said that in either typical or complex H.R system, the footprints are always of human kind that leads firm to the level of success and acknowledgement, therefore without their consideration and efforts and organization cannot achieve the actual cause of reengineering. Hammer & Champy (1993) noted one of the important attribute of BPR is to take advantage from highly educated and capable work force work around process are taking place of task oriented jobs.

Paper et.al (2001) argued that before implementing BPR it is very important to design a proper plan to be executed and then recognize the difficulties that might be faced. Top management should make change management a top priority and communicate the change vision across the organization. Top management needs to communicate to its people why the change is necessary and how it will impact everyone's current job and future with the company. Top management needs to convey to its people that BPR is not being used to replace workers, but to improve quality, reduce cycle time, and create value for customers. Employee should be educated about the change and they should be given a view that they are key enablers of change, give them chance to ask questions to satisfy themselves, provide them a road map so that they manage their attitude and behavior. In all this process to implement change, employees' need consideration and this is the only way to make the change process successful. This study did not help in providing any objective evidence about how imperative is HR or to what extent they needs to be educated about change or should be provided with any training to cope with the change BRP is striving to bring? The major limitation of case study research was sample size that limits generalizability. A specific limitation is that this case was industry-specific. Although case studies rate low on generalizability Change is painful and difficult to implement.

### 2.3 Causes of Failure

Besides the success stories of BPR there is a list of failures in business world. These causes of failure vary from case to case and company to company. Some of the common reasons pointed by authors (Hammer and Champy, 1993; Mashari & Zairi, 1999; Bhatti, & Jayaraman, 2008; Belmiro et al. 2000); are;

- Management heterogeneity
- Vague methodology
- Cross-functional teams creating problem
- Employee commitment and job security

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- Focus on short-term objectives
- Basic concept: companies that are following someone's footsteps ignore or are not able to fulfill the prerequisites of BPR and results in failure.
- Lack of proper training
- Other reasons including, lack of resources, leadership, communication, resistance to change, organizational structure, organizational culture.

MacIntosh (2003) compared BPR practices in public (two examples) and private sector and concluded that the attractiveness of BPR is same in both sectors. Furthermore, researcher shows that it is more appealing in public sector where mostly employees are dealing with handicap resources. One of the major findings of this study was due to limited resources and other constraints in public sector, consultants' services are not used nor are involved in the process due to which employees will have to participate and act as planners, implementers and evaluators at the same time.

This study also fails to provide advocate information and reasons about the success and failure, nor it highlighted the facts that are those employees who are involved in all the steps taken for BPR actually possessed any skills to perform the task or were they having any knowledge about the need and importance of BPR? Similarly the study cannot be generalized for all the public sector as no statistical evidence was produced. Thus, study was attempted within limited resources and small sample size.

Belmiroet. al. (2000) in there study conducted on implementation and human resistance factors of BPR project are of the opinion that, educating employees regarding change and need of change. They further concluded by using one of the best tool is empowerment of employees thus, management needs to devote time and work on proper planning of communication Modeling. Employees' willingness and interest in BPR success is essential therefore, researchers rummaged for their answer in large manufacturing firms through interviewing (qualitative technique) and the main focus were on companies that were under the implementation process. Like other studies conducted previously, this study is also based on qualitative technique.

Furthermore, in support of the topic and its urgency to be highlighted, Jain et. al (2009) discussed and collected opinion of employers (management) on 19 topics of BPR and concluded that they are in the favor of providing support to the employees in gaining the right level of skills and knowledge in accommodating the transition and to insure the success of BPR. Furthermore, researchers addressed the issue that employees needs to know the fundamentals of BPR and thus are having strong emphasis on training and development courses necessary for employees.

It is a matter of fact that BPR is the main focus in every sector across the globe and it still needs to be addressed as it is taken as an art not as science because of lack of frameworks, tools and techniques. Mansar (2007). Like private sector, it is assumed and anticipated by many authors that BPR will bring radical change in public sector with the empowerment of employees, educated them about the need for change and there role in successful implementation and also by providing them with advocate support in terms of training and resources as discussed by McAdam & Donaghy (1999).

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Many researches were conducted in past decade about the BPR and most of them were subjective in nature. Researchers tried to highlight the importance of BPR and role of HR in implementation of BPR but, no proper statistical evidences are present. Education and training are one issue among many that needs to be addressed properly and should provide proper support on its relationship with BPR.

Moreover, public sector is almost neglected by the researchers from under developing economies due to lack of support and many other reasons. Therefore, this study will help in expanding the body of knowledge and provide justifiable results for future studies.

### **3. Research Hypothesis**

Herzog, et al. (2007) developed a model based on variable (CSF) but was hypothetical and needed to be tested to provide adequate impact on BPR. This study revealed from problem statement, review of literature, questions and research objectives leads to treat the following hypothesis:

H<sub>1</sub>: There is significant relationship between education & training and Success of BPR

### **4. Research Methodology**

To achieve the objectives of proposed study, research was executed in two phases i.e. a pilot study and the main study.

Population: The target population for this study was the services sector (public sector) under the government of KPK that are undergone and adopted BPR till June 2011. Focus of this study was on identifying the public sector functioning departments that are aimed for reengineering or are already under process of change. Upon identification of those departments, 7 of public sector organizations were currently under process of BPR. Only two organizations/ departments Computerized Driving Licensing Authority (CDLA) and Excise and Taxation (E&T) selected from population on the basis convenience. Later on the sampling frame based on simple random sampling within the population.

#### **4.1 Instrument**

Data for this study was collected by distributing self administered questionnaire i.e. based on questionnaire used to conduct similar study by Herzog, et al. (2007) after modifying to fit according to the requirements of this study and the reliability of instrument was tested for its consistency and reliability.

##### **4.1.1 Education and Training**

In this study education refers to the communication and information shared with the employees regarding the business process reengineering and educating the employees

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regarding the reason, benefits and importance of BPR. Furthermore, education means, educating the employees about the role of employees in this radical change process. Training means providing all the necessary training to the employees about the new technology, the use and purpose of I.T and to prepare employees for teamwork and work in dynamic environment. Education and training is important for any organization to incorporate any kind of change, modification, innovation or process improvement. Education and training in relation to BPR was assessed by items derived by Herzog, et al. (2007) in their study. Tool contained 9 items to measure the education and training and answers were to be presented by selecting one of the 5 point Likert's scale with 1 for "very low" and 5 for "very high". In total the score can range between 9 and 45. Those questions asked were regarding the training about the importance and role of BPR, its benefits, cooperation, teambuilding and group dynamics, top management level of interest, top management capabilities and motivation and support, and about the availability of training resources.

### **4.1.2. Successful Implementation of BPR**

Successful implementation of BPR in this study refers to the results i.e. cost minimization, productivity enhancement, efficiency in work at time consumed and to the ease and support from the implementation of BPR. Every organization that undergoes through reengineering process wants to achieve the objectives that are expected from BPR. The implementation of BPR will decide the success or failure of the process. 5 items were to explain the success of BPR with the help of teamwork and training, including cost minimization, efficiency, effectiveness, ease, and productivity of the firm. These elements are the output of successful implementation of BPR in any organization. The responses were to be presented by selecting one of the 5 point Likert's scale with 1 for "very low" and 5 for "very high". In total the score can range between 5 and 25.

### **4.2 Sample**

After the confirmation of the research instrument with the sound reliability, the next phase of study was to scrutinize the liaison of the variables. Questionnaires were distributed in person to the line managers, supervisors, and senior officers and to the middle management (632 in total were in management). In total 120 questionnaires were distributed (60 each department) based on simple random sampling, availability and accessibility. The response from the sample was very good and 104 (86.6%) responded by completing the questionnaires. Among 104 responses, three questionnaires were incomplete, therefore were not included for analysis. 48 (80%) and 53 (88%) were the responses from CDLA and E&T respectively. Selection of respondents was purely on convenience based sampling. Data was collected during June, 2011 as recent as possible.

### **4.3 Statistical Methodology**

- Data was analyzed by using different statistical tools. The raw data was analyzed and presented in appropriate tables.

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- At first, demographics of the respondents were arranged and tabulated by using descriptive statistics (frequency distribution) to get basic idea about the respondents.
- Thereafter, data reliability was calculated. Overall reliability as well as the individual variable's reliability was tested to confirm the tools and data collected were reliable for the study. For Reliability Cronbach's  $\alpha$  was used.
- Relationship between variables i.e. dependent and independent variables was computed by using Pearson correlation test.
- After verification of data and tools through reliability and measurement of relationship between variable through Pearson Correlation, data was analyzed by linear regression analysis techniques to estimate the predicted value of dependent variable in relation to the value of independent variable.

With the help of described population sample was drawn and with the help of research instruments the data was collected and later on was analyzed by using the statistical tools as discussed above. In next chapter the findings of the study are presented and later on are discussed in detail.

### 5. Data Analysis and Presentation

<b>Table # 1: Descriptive Statistics for Respondents</b>					
Items	N	Min	Max	Mean	Std. Dev
Education & Training	101	1.67	4.33	3.37	0.72686
Success of BPR	101	1.80	4.40	3.24	0.74994

#### 5.1 Internal Consistency Reliabilities

Internal consistency was measured in the first phase of reliability test in pilot testing by using Cronbach's alpha (see table 2). Alpha results ranging from moderate to high, (0.692 to 0.877) indicating the reliability coefficients in acceptance range.

#### 5.2 Correlation Between Education & Training and Success of BPR

Pearson correlation test as bivariate correlation was applied to test hypothesis (H1) i.e. education and training is having significant relation with successful implementation of BPR. Result indicating that education and training is having a significant effect on successful implementation of BPR. Thus, result supports and accepts the hypothesis H1. Table 3, includes the results explaining a significant correlation between education & training and BPR success. Earlier it was said that the considerable level of significance for this study was assumed to be  $p < 0.05$  while the Pearson correlation showed significance 0.000 on  $p < 0.01$ . Result indicates that education and training are positively associated ( $r = 0.672$ ) with successful implementation of BPR. Hence, the hypothesis H1 has proved to be positively significant.

<b>Table # 2. Internal Consistency Reliability</b>			
<b>Variables</b>	<b>Cronbach's Alpha</b>	<b>Cronbach's Alpha Based on Standardized Items</b>	<b>N of Items</b>
<b>Education and Training</b>	0.692	0.689	9
<b>BPR</b>	0.877	0.878	5

### 5.3 Regression Analysis

Following were the results derived from linear regression.

#### 5.3.1 Correlation Coefficient “R”

Correlation coefficient (R.) refers to the degree to which two or more independent variables (X) are related to dependent variable (Y). R value ranges between 0 and 1. Linear relationship between the variables can be positive or negative. Closer to 1 indicates better relationship between the variables.

From the model summary the data analyzed shows “R” 0.708.

#### 5.3.2 Coefficient of Determination “R<sup>2</sup>”

Coefficient of determination is use to determine model fit. The closer the value to zero indicates that the X and Y are not related to each other and residual value is perfect. On the other hand, closer to 1 indicates that X and Y variables are perfectly related with no residual variance among dependent and independent variables. Often used in goodness of fit of the model and indicates how much dependent variable is explained by the independent variables. As this research comprised of two independent variable and value of R square was 0.501 means that only 50.1% of the variance dependent variable (BPR) is explained by X1 and X2 and the rest is residual variance.

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Table: 3 Correlations Of EnT And BPR			
		Education & Training	BPR
<b>Education and Training</b>	Pearson Correlation	1	.672**
	Sig. (2-tailed)		.000
	N	101	101
<b>BPR</b>	Pearson Correlation	.672**	1
	Sig. (2-tailed)	.000	
	N	101	101
** . Correlation is significant at the 0.01 level (2-tailed).			

### 5.3.3 Standard error of Estimate

Standard error calculated was 0.535, showing that data spread around the mean of data is normally distributed with less standard error and hence the mean deviation of sampling distribution is very small.

### 5.4 Durbin-Watson (DW) Test

D-W test result calculated was 1.925 indicated that there was no autocorrelation in the variables. (See table 4)

Durbin-Watson is a test of statistics for the analysis of autocorrelation. It helps in verifying whether residuals are correlated or not. This test results ranging between 0 and 4 and is divided into two parts. Value of 2 means no autocorrelation. If the value or result is between 0 and 2, then it indicates that there is positive autocorrelation between residuals while above 2 indicates negative correlation. Furthermore, Field (2009) argued and suggested that DW values are of concern if it is less than 1 or greater to 3. Value closer to 2 is of less concern, but its value depends on the sample size as well as on the number of variables in research.

Table: 4 Model Summary <sup>b</sup>					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.708 <sup>a</sup>	.501	.490	.53538	1.925

### 5.5 Coefficient

To test the hypothesis in detail, data was analyzed by using “t-test” also known as student’s t-test. This test provides an indication that whether variables are separate or

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not and also check the differences among the variables. T-test statistics were calculated with the assumptions that data was normally distributed and their variances are equal. Results showed that the value of Beta (B1) is 0.773 and standard error of .257. This means that while all other variables are constant of zero, the value of BPR will be 1.193. Standard error of constant is less than half of B1 therefore results are significant. Similarly t-value and level of significance is less than 0.05.

X1 (education and training) an independent variable was having .532 beta (B2) with std. error of .090 and t-value of 5.910 with .000 significance level. Thus, the hypothesis H1: There is significant relationship between education & training and Success of BPR has proved. This result shows that education and training has a significant positive relation with the success of BPR.

The equation of regression according to the results is as:

$$Y_0 = \beta_1 + \beta_2 X_1$$

Success of BPR = 0.773 + 0.532 (education and training)

Table: 5		Coefficients				
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.773	.257		3.004	.003
	EducationTraining	.532	.090	.516	5.910	.000
a. Dependent Variable: BPR						

## 6. Discussion

### 6.1 Correlation Between Education & Training and Success of BPR

In previous studies, researchers concluded that education and training plays vital role in the successful implementation of BPR. Infect educating employees about the need of reengineering and training them on the new process (adaptation of new and advance technology) will help the top management in smooth transformation of organizational transformation. (Mashari & Zairi 1999; Worsley 1994; Herzog et al. 2007). Therefore, to take full use of employee's skills and abilities, intensive programs should be incorporated claimed by Towers (1994). Trainings are especially important for line and middle management as they are directly involved in organizational change process and are mostly affected by the reengineering. Educating employees on the new technology and its benefits is of most importance in success of BPR. Bhatti & Jayaraman (2008), conducted study on success factors of BPR and concluded that user training (employees' training) is one of the important and critical success factors of BPR with mean value of 5.90 and P-value of 0.000. This shows significant and positive relation of training and success of BPR. Similarly Smith (2003) also described training as a critical success factor for BPR.

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Thus based on previous studies and their results (positive significant correlation), hypothesis was drawn that education and teamwork is having significant relationship with successful implementation of BPR. The result of Pearson correlation indicated a positive correlation ( $r = 0.672$  and  $P < 0.05$ ) between education & training (independent variable) and successful implementation of BPR (dependent variable). Thus from the study it is proved that a strong correlation exists between education & training and BPR success. Results indicating that higher the skills development programs the better will be success in BPR. Ignorance to the education and training will result in financial loss as well as failure of the reengineering process strongly recommended by Davenport (1993).

### 6.2 Regression Analysis

Regression model showed very strong and positive relation between dependent (successful implementation of BPR) and independent variable (education & training). Model showed strong coefficient of correlation ( $R = 0.708$ ), indicating 70.8% of relation between the variables. On the other hand coefficient of determination ( $R^2$ ) was also 0.501. Furthermore, on calculating the autocorrelation by using Durbin-Watson (DW) test (1.925) result indicated that there was no autocorrelation predicted. ANOVA model fit test also showed positive and significant results ( $F = 49.109$ ,  $P < 0.05$ ) and was in support of the third hypothesis i.e. both education & training and teamwork are having significant relation with successful implementation of BPR.

### 7. Conclusion

Analysis shows that successful implementation of BPR requires top management to consider and provide all the necessary education and training to the workforce. Study revealed that there is strong correlation between teamwork and successful implementation of BPR. Employees need proper education and training and the previous studies also suggests the importance of these variables in success of BPR. In public sector of KPK, government is working on process reengineering and it is important to provide proper education and training to the workforce. Technology is changing every passing day and computation of the organizational process is the aim of public as well as private sectors. Thus, it is necessary to ensure the education of employees' regarding reengineering. Employees needs to be guided regarding the benefits, reason of change and its importance for the organization as well as importance for the employees in terms of cost minimization, productivity enhancement for the organization and efficiency, effectiveness, ease and support that technology will bring for the employee. Similarly, employee needs training on the technology, cooperation, teamwork, coordination and their role in the reengineering. Moreover, training is important for top management as well because they are source of inspiration and motivation for subordinates. Thus, training of top management about the BPR and their role in radical change process is vital. Therefore, public sector needs to consider the importance of teamwork and needs to plan for constructing effective cross-functional teams across the organizations. BPR implementation is not a one man show, and teamwork is an essential to achieve organizational goals and objectives.

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This study was conducted with the aim and objective to define the role of education & training in the successful implementation of BPR in public sector of KPK. Study showed a positive effect of education & training on BPR implementation. Thus, it can be said that both teamwork and education & training are integral parts of successful implementation of BPR in public as well as private sectors of developed and underdevelopment countries. Any organization that is planning to reengineer needs to plan and work on providing education & training and constructing effective teams to achieve the desired goals from successful implementation of BPR.

### 7.1 Limitation of Study

Like most of the studies, this study also had some limitations; the major limitation of case study research is sample size that limits generalizability. A specific limitation is that this case is public sector oriented. One of the limitations of this research is the size and representation of the data collected. A final limitation is of applicability in under developing countries. Results may differ in other regions and in developed economies.

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