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Causes of Business Process Reengineering Failure in the Kingdom of Bahrain and Saudi Arabia

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ABSTRACT

Business Process Reengineering (BPR) has been one of the methodologies which aims at achieving a radical change that would drive the organization to new heights and assists it to harness its potential. Even though there are literature that marked lots of success stories in BPR projects, there are also other literature that cited a failure rate that reaches 70%. To investigate the reasons behind BPR project failure, secondary data from past literature relevant to our research provided a platform to devise a wide-ranging register of ninety one (91) potential contributors to BPR project failure. These factors were reproduced in a Likert type questionnaire to elicit the views of respondents and allow the researcher carry out causal analysis. The data collected in the empirical field research from Kingdom of Bahrain and Kingdom of Saudi Arabia which accounts for one hundred and ninety two (192) responses, it was diverse in terms of process, industry, managerial position, company size and others. The analysis showed that the improper reengineering of IS legacy systems, ineffective process redesign problems, IT investment & sourcing decision, training problems and ineffective use of consultants are the most significant contributors to a BPR project failure whereby these factors can collectively explain about 69.8% of the variation in the BPR project failure. IBM-SPSS software was used in the data analysis phase of this work.

***Keywords*—** Business Process Reengineering (BPR), Regression Analysis, Critical Failure Reasons

I. INTRODUCTION

Business Process Reengineering (BPR) is not an obscure concept to the business world. It has been more than two decades since it was introduced for the first time as a tool for change in American business sector. Business process reengineering is a technique applied to get major modification in the organizational processes and it was implemented firstly in early 1990s. Processes reengineering is a new method that used for the management field that offers improvement through radical change in organizational performance.

BPR is considered as major change and rethinking on the whole process to achieve performance of the organization in terms of quality, cost, speed and service; in addition, it is a practice of analysis and redesigning of the workflow in an organization.

1.1 Statement of the Problem

In the Kingdom of Bahrain and the Kingdom of Saudi Arabia, many steps are carried out in reengineering of business processes by private, government sectors. For instance, Department of Consumer Protection under the Ministry of Commerce implemented the BPR project which was applauded by most of the reviewers due to the fact that it paved way to ease of procedures that was obvious after applying reengineering. Moreover, many seminars, conferences and workshops are conducted in areas related to BPR. It is very clear that there is an increased level of official concern for the periodic review of the applied BPR projects for which several meetings were held which were dedicated solely to process reengineering under the direct supervision of the council of ministers [1], [2], [3].

Even though, there was a lot of interest towards the applications of BPR, some organizations did not succeed, and some of them did not achieve the desired goals. In most of the cases, the organizations repeated the process reengineering again and again to be more commensurate with the requirements and evolution, such as Gulf Air in Bahrain, which is in a continuous evaluation and repetition of the reengineering operations till this day. The frequent repetition of these BPR operations indicates that there exists a problem in BPR implementation. There were limited studies in Saudi Arabia about implementation of BPR; additionally, there is a lack of studies revealing the main causes of BPR failure. While in Bahrain, there is no study that exists in BPR, therefore, this study will be the first of its kind in Bahrain. There are a number of factors that are influencing the reengineering process in Bahrain and Saudi Arabia. This research is thus guided by the question: what factors actually lead to the failure in implementation of the reengineering process in both Bahrain and Saudi Arabia?

II. METHODOLOGY

2.1. Research Design Method

In this research, researcher made use of both, quantitative and qualitative research. The qualitative approach was needed for the exploratory aspects to identify "what are the factors that might contribute to the failure of a BPR project?" Secondary data from the literature were of premium importance and helped researcher formulate a list of potential failure causes for BPR projects. The researcher then applied the quantitative research techniques – which was more apparent in this study than the qualitative techniques – to build up the research results. The research had a cross-sectional design based on nineteen dimensions (Table I)

Table I: Potential disciplines from which BPR implementation problems might stem

(1)	Lack of organizational readiness for change
(2)	Problems related to creating a culture for change
(3)	Organizational resistance to change
(4)	Problems in communication
(5)	Problems related to training and education
(6)	Problems related to commitment, support, and leadership
(7)	Problems related to championship and sponsorship
(8)	Ineffective Business Process Reengineering teams
(9)	Problems related to the integration mechanism, job definition, and allocation of responsibilities
(10)	Problems related to Information Technology investment and sourcing decisions
(11)	Improper Information systems' development & integration
(12)	Ineffective reengineering of legacy Information System
(13)	Problems related to BPR Project
(14)	Problems related to performance measurement
(15)	Inadequate focus
(16)	Ineffective process redesign
(17)	Problems related to Business Process Reengineering resources
(18)	Ineffective use of consultants
(19)	Financial problems

The questionnaire was prepared basically from the information available in the relevant literature.

The sample population for this study adopts a convenience sample selection process. Within the context of the current research, the researcher defined the population as the set of companies operating in the Kingdom of Bahrain and the Kingdom of Saudi Arabia that experience BPR project. These companies might be SME (Small-to-Medium Enterprises) or large enterprises, private or governmental sectors publicly traded or privately owned.

2.2. Construct Computation

Once a set of itemized questions had passed both the reliability and validity tests, it would be qualified to be converted into a summated construct (also referred to as composite variable, summated variable or summated scale). The summated construct would be computed based on the arithmetic mean formula. For example, construct 1 (M1.X1) was composed of three items Q4.1, Q4.2, and Q4.3. If these three items have passed the reliability and validity testing, the summated scale M1.X1 would be computed as follows: M1.X1 = (Q4.1 + Q4.2 + Q4.3) / 3. This was also applicable for other constructs.

Identifying the constructs was a task of considerable importance, and fully depended on how the notion of the summated scale was apprehended. In this research and as seen later, a regression model was built, (M1). It was a regression model whereby the independent variables were computed based on a subjectively predetermined dimensions depicted in Table I.

III. LITERATURE REVIEWS

3.1. Theoretical and Conceptual Frame Work

At this point, we present the conceptual definition and specific meaning of some important terms related to this study. BPR is defined in so many ways, depending upon the condition, context, approach, and purpose of implementation. Thus, the researcher considered the following issues to clarify some confusion brought about by writer's varied views regarding the term BPR.

Due to the classical belief that there is a unique best practice to do tasks, Fredrick Taylor in 1860's, noted that managers are in the best position to determine the process that is the best for performing work and reengineering echoes. At that time, large companies were not allowed by technology to propose processes in a cross-functional or cross-dimensional perspective. For efficiency improvement, specialization was the state-of-the-art method at that time. [4] viewed BPR as a rationalizing and restructuring tool to downsize the staff and selling of business units. Others viewed it as a management tool and technique for minimizing costs, maximizing return and productivity.

To some extent, reengineering seems to be a present version of the Taylor's scientific management model which aimed to apply scientific and empirical

methods in understanding the flow of work at the shop room level ([5]). Taylor's time analysis and motion study contributed to the principle of understanding the flow of work thus, eliminating wastage and fatigue which caused unproductivity among workers. Reengineering runs parallel to this with one exception; it emphasizes a more radical idea on abandoning old systems and starting anew. Taylor's methods became influential to the discipline of public administration making it extremely popular. Thus, reengineering could just be a variant of neo-Taylorism as viewed by [6].

As BPR is a business management strategy which has its own methodology. Its implementation needs a series of sequential steps beginning with the identification whether an organization should employ BPR or not to the last application of redesigned series of stages and final adjustments in addition to processes improvements.

Therefore, to implement BPR, a chain of sequential steps has to be pursued. In this direction a number of scholars, for example [7], [8], [9], [10], [11], [12] published different sets of methodologies. To throw some light on the notion of BPR methodologies it is worth mentioning some methodologies from existing literature. Hence, some of the scholars are reviewed hereunder with emphasis on BPR execution.

From the point of view of [9], there are four basic steps that need to be pursued. Firstly, a needs analysis should be conducted to know whether the organization needs to employ BPR or not. Secondly, organizations deciding to slot in BPR need to make initial preparations. This step also includes making an organization's vision and objectives clear, good communication with the employees, setting standards for organizational culture, and forming a redesign team. Thirdly, the redesign team formed at the second step begins reengineering of process. Finally, they have to newly design process to check the performance and if required, improvement and revision made, with the purpose of employing the process throughout the organization.

To get successful BPR, this step also consists of reforming the original structure of the organization, evaluation of the performance, staffing, and technological alignment of the newly designed process.

[13] conceptualized the implementation of BPR as the continuing process of preparing and getting the organization ready for the new system and introducing it to guarantee its successful use. Applying the redesigned process is not easy and it is a complex process that involves resource allocation, strategy alignment and project planning.

As per [7] the execution stage is classified into two parts. One is the redesigned process examined and applied, the second part is the management and measurement system, organizational structure alignment, IT to new process, and values and beliefs.

More precisely, [11] gave the following appropriate steps:

1. Building a charter.
2. Creating communication strategies.
3. To review the model, hold an all-hand meeting.
4. Organize an implementation plan with details.
5. Doing pilot tests; modify the redesigned processes if required.
6. Execute short-term alteration.
7. Phase in long-term changes.
8. Evaluate the new process performance.

These steps emphasized that applying plan must be created to clarify the work that needs to be completed, with resource allocations, decision points and timeframes. Regarding Pilot testing, it offers a scheme for process refining and building support for the occupied implementation. Additionally, the issues of training, educating and workforce are vital for successful implementation plan.

Furthermore, the steps stressed the significance of ongoing measurement of the performance, response and feedback to improve the new processes once it is implemented.

Moreover, at the core of business process reengineering study and practice a prime question has been raised, whether there are robust methodologies and accessible tools to ease the required outcomes from BPR practice. The wrapping up has been that even with many approaches, there is a lack of integration and an immaturity on the methodological front ([14], [15]). Consequently it can be concluded from these review that organizations and companies should adopt an appropriate process reengineering methodology to serve as a framework for successful BPR.

3.2. Empirical Studies on Business Process Reengineering

Many studies have been undertaken till date from the beginning of business process reengineering at 1990s, and concerns on BPR increasing year after year. Therefore, in order to underline literature gaps, in this section selected empirical studies on BPR implementation factors are reviewed.

[13] performed a study on the research area of BPR trying to discover various challenging factors of adopting BPR and explore the implementation problems. To accomplish this study, based on BPR history and past researches related to the implementation of organizational change, the authors identified 64 BPR implementation problems. Further, the identified problems were classified into 6 major groups, specifically project management problems, technological competence problems, change-management problems, management support problems,

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process delineation problems, and project-planning problems.

Then, the authors surveyed several organizations and clarified that addressing project planning problems and technological competence problems are necessary, but not sufficient conditions for reengineering success. Further, problems related to project management and training personnel for the redesigned process are highly related to project success. At the end, the results of [13] noted that to avoid failure in BPR implementation, the authors recommend that organizational change to be basically managed and balanced with consideration to be paid to management support and technological competence, as well as factors that pertain directly to the conduct of the project e.g. project management and process delineation.

[16] investigated the applicability of BPR in higher education institutions of UK, in addition to factors that influence the business process reengineering. At the initial fleeting look, the authors recognized a range of factors that make reengineering in these universities a hard process. The factors are requirements of complex information, institutional policies, senior management approval, traditional change programs, Information Technology motivated change, academic freedom, retaining the current situation, inertia, unsuccessful human resources reengineering, and organizational alteration.

The results of the study were that the main factors of BPR limitation were organizational culture and structure of higher education institutions, in addition, insufficient attention given to the human resources side of change management. The authors claimed that in their case study of the selected five universities represent a restricted approximation of BPR practices. Thus, the project was all about process improvement and not about organizational radical change by obliterating existing processes. Accordingly, [16] concluded that the BPR radical change clashed with the mentioned factors.

In order to display the mentioned causes of BPR failure in the questionnaire with their subcauses with more clarity, researcher used visualizing and represented them using a graphical technique called “Fishbone Diagram” as shown in figure 1.

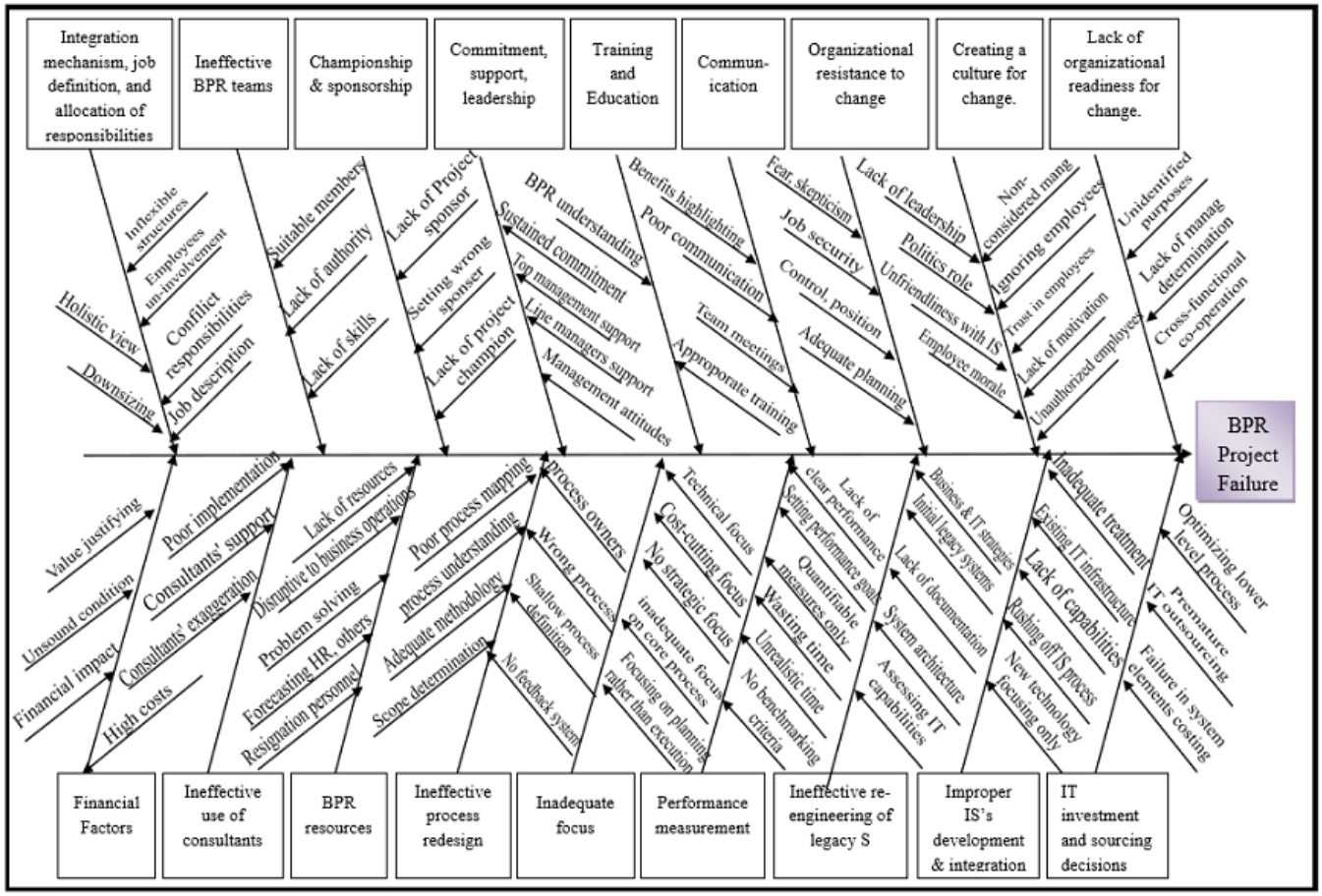

Figure 1: Fishbone diagram of BPR failure causes (Done by the author)

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IV. RESULTS

4.1. Regression Analysis for Model One M1

The proposed regression model after building the summated constructs is:

$$Y = \beta0 + \beta1*M1.X1 + \beta2*M1.X2 + \beta3*M1.X3 + \beta4*M1.X4 + \beta5*M1.X5 + \beta6*M1.X6 + \beta7*M1.X7 + \beta8*M1.X8 + \beta9*M1.X9 + \beta10*M1.X10 + \beta11*M1.X11 + \beta12*M1.X12 + \beta13*M1.X13 + \beta14*M1.X14 + \beta15*M1.X15 + \beta16*M1.X16 + \beta17*M1.X17 + \beta18*M1.X18 + \varepsilon$$

Where;

Y. Represents the measure of the factors related to business process reengineering project failure.

M1.X1. Represents the measure of the factors related to organizational readiness for change

M1.X2. Represents the measure of the factors related to creating a culture for change

M1.X3. Represents the measure of the factors related to organizational resistance to change

M1.X4. Represents the measure of the factors related to communication

M1.X5. Represents the measure of the factors related to training and education

M1.X6. Represents the measure of the factors related to commitment, support, and leadership

M1.X7. Represents the measure of the factors related to championship and sponsorship

M1.X8. Represents the measure of the factors related to Business Process Reengineering teams

M1.X9. Represents the measure of the factors related to the integration mechanism

M1.X10. Factors related to Information Technology investment and sourcing decisions

M1.X11. Represents the measure of the factors related to improper information systems' development & integration

M1.X12. Represents the measure of the factors related to ineffective reengineering of legacy Information System

M1.X13. Represents the measure of the factors related to performance measurement

M1.X14. Represents the measure of the factors related to inadequate focus

M1.X15. Represents the measure of the factors related to ineffective process redesign

M1.X16. Represents the measure of the factors related to Business Process Reengineering resources

M1.X17. Represents the measure of the factors related ineffective use of consultants

M1.X18. Represents the measure of financial factors ε Represents an error term

SPSS stepwise regression results are summarized in Table I through Table III which reflects some very interesting insights about the model governing the relationship between the failure of business process reengineering project and the eighteen (18) predefined organizational factors.

By observing only the last row of Table II as the stepwise regression was applied, the results reveal two important pieces of information; the column labeled "R" shows a strong positive correlation (the coefficient of multiple correlations (R) = 0.836) between the failure of a business process reengineering project and five organizational factors namely (1) Ineffective reengineering of legacy information system, (2) Ineffective redesign, (3) Information Technology investment and sourcing decisions, (4) Training and education problems and (5) Ineffective use of consultants.

TABLE II
Coefficient of correlation and coefficient of determination of the regression model M1

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.743	.552	.550	.73910
2	.799	.639	.635	.66550
3	.816	.666	.660	.64211
4	.826	.682	.675	.62830
5	.836	.698	.690	.61320

The column labeled "R square" (coefficient of determination) reveals that 69.8% of the variability in the failure of a BPR project is explained by these five organizational factors previously mentioned; in other words, only 30.2% of the variability in the BPR project failure is attributed to unknown causes. It is noted that the coefficient of determination ranges between 0 and 1. This reflects the proportion of how much variability in the dependent variable is accounted for by the predictors.

Table III shows the "ANOVA" for the regression model. ANOVA stands for Analysis Of Variance, and it is specifically dedicated for the analysis of the model's overall fitness in explaining the relationship between the dependent and independent variables; in regression analysis, the null hypothesis is that "In the population, all values for the regression coefficients are 0". If the significance (P-value) of the F statistics is smaller than certain risk level (0.05), then the null hypothesis would be rejected and that the independent variables provided the best quality fit in explaining the variation in the dependent variable, but in case the opposite is true, i.e. the significance is higher than 0.05, then this means that the null hypothesis failed to be rejected and that the independent variables would not explain the variation in the dependent variable.

As reported in Table III, the overall significance ($p=0.000$) is less than ($\alpha=0.05$), hence this model is significant in interpreting the relationship between the dependent and the independent variables.

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TABLE III
ANALYSIS OF VARIANCE – FITNESS OR APPROPRIATENESS OF THE MODEL

ANOVA

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	161.994	5	32.399	86.165	.000
Residual	69.938	186	.376		
Total	231.932	191			

Finally, the table of coefficients (Table IV) reports the values of β's as proposed by the regression model. It is noted that for each coefficient there exists a significance level; the null hypothesis β's is equal to zero was tested. The outcomes expose the significance levels for β1 (0.000), β2 (0.002), β3 (0.025), β4 (0.000), β5 (0.002) are all less than 0.05, and hence the null hypotheses can be rejected. On the contrary, the significance level for β0 (0.343) is higher than 0.05 which means that this null hypothesis (β0 = 0) failed to be rejected. The other factors were automatically eliminated by the software due to the employment of stepwise regression (in other words, the significance for their coefficients is higher than 0.05 and thus the null hypothesis hold true).

In conclusion, by using the standardized coefficients or betas, the refined regression model that explained the relationship between BPR project failure and organizational factors in the population is stated as follows:

Y (BPR project failure) = 0.314*M1.X12 (IS Legacy) + 0.204*M1.X15 (Ineffective Redesign) + 0.151*M1.X10 (IT investment & sourcing decision) + 0.176* M1.X5 (Training problems) + 0.183* M1.X17 (Consultants) + ε.

TABLE IV
Regression Model Coefficients for Model M1

Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
	B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
(Constant)	.220	.231		.950	.343	-.236	.676		
IS Legacy	.292	.063	.314	4.666	.000	.168	.415	.358	2.791
Ineffective Redesign	.195	.062	.204	3.159	.002	.073	.317	.390	2.562
IT investment & sourcing decision	.141	.062	.151	2.265	.025	.018	.264	.367	2.728
Training problems	.135	.038	.176	3.556	.000	.060	.211	.662	1.511
Consultants	.171	.053	.183	3.213	.002	.066	.275	.497	2.010

Several inferences are concluded from this regression model.

1. Only five factors are significant contributors to the failure of a BPR project, namely "Ineffective reengineering of IS legacy", "Ineffective Redesign", "IT investment & sourcing decision", "Training and education problems" and "Ineffective use of consultants". The combined effect of these five factors explains 69.8% of the variation in the rate of failure of a BPR Project.
2. Since the partial regression coefficients are positive, there is a positive correlation between the failure in BPR project and its five predictors; in other words, as any of the predictors increases, the overall of BPR project failure rate increases.
3. The other thirteen (13) organizational factors have an insignificant contribution to the failure of a BPR project.

V. CONCLUSION

Organizational change based on the business process reengineering is affected by many factors at different levels. Based on the literature, the researcher was able to identify ninety-one (91) potential contributors to the failure of BPR. Some of these contributors were directly related to the BPR and others were related to organizational factors. A Likert-type scale survey was developed to collect the opinions of the respondents; the data was introduced into SPSS. A regression model M1 was developed based on confirmatory factor analysis. In terms of the coefficient of determination, five predictors only emerged to be significant. These factors are related to the ineffective reengineering of IS legacy, ineffective process redesign, IT investment & sourcing decision, training problems and ineffective use of consultants. The analysis showed that these three factors are capable of explaining about 69.8% of the variation in the BPR failure.

On the basis of the findings of the reasons behind the BPR project failure, it is recommended that the organization should focus more on the mentioned five main causes to ensure that their BPR-related change efforts are comprehensive and well implemented and also the organizations should make every effort to minimize the chances of failure.

More attention should be given to the cause of "factors related to ineffective process redesign" since it has been increasingly considered by the researcher as a vital component of successful BPR efforts. Consequently, the organization has to apply strong process mapping, follow an adequate methodology, determine the scope of change adequately, define the process comprehensively, provide feedback systems like surveys to determine what's working and what's not.

Organizations must also concentrate on the problem of "Improper IS' development and integration", where the proper integration of various organizational IS is very important to stay away from failure of BPR implementation. IS integration for BPR can be measured by the extent to which various information systems are formally linked to the purpose of sharing complete, consistent, accurate, and timely information among business processes. Data integration and communication networking are the most important enablers for IS integration.

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