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BPR implementation process: an analysis of key success and failure factors

Mohamad Reza Khoshlafz[a*] and Seyed Mohsen Mousavi Hekmati[b]

[a]*Department of Management and Accounting, Qazvin Branch, Islamic Azad University, Qazvin, Iran*
[b]*Department of Industrial Engineering, Mazandaran University of Science and Technology, Babol, Iran*

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A B S T R A C T

This paper investigates the effects of different factors influencing on the successful implementation of the business process re-engineering (BPR) in Iran. The study selects 386 experts randomly and using some statistical tests examines the effects of four groups of factors including strategic, organizational, methodologic and technological & educational issues on the success of the BPR implementation in Iran. The study designs a questionnaire in Likert scale and distributes it among some experts where Cronbach alpha was calculated as 0.71. The implementation of Pearson correlation ratio has confirmed that technological and educational factors marinated the highest effects (r = 0.523, Sig. = 0.000) followed by strategic (r = 0.505, Sig. = 0.000), organizational (r = 0.352, Sig. = 0.000) and methodologic issues (r = 0.267, Sig. = 0.000). In addition, the implementation of Stepwise regression has confirmed that technological & educational, strategic and methodologic factors influence on BPR in Iran.

1. Introduction

In the face of growing competition and economic pressures, most firms are shifting their fundamental unit of analysis from the business function to the business process (Grover, 1994). Business process reengineering (BPR) involves the severe change of age-old processes for substantial improvement in performance. Information technologies are also important enablers of this change (Johansson, 1993; Chang, 2016). BPR has been considered as necessary for making any improvement in organizational competitiveness (Guimaraes, 1997). During the past two decades, there have been successful and unsuccessful cases; therefore, there is a necessity for systematic and rigorous evaluation of the factors for the success of BPR implementations. According to Guimaraes (1999), success can be defined in three ways: goals and objectives completed by the project, benefits extracted from the project, and the project's effect on company performance. Guimaraes (1999) reported that organizations were not emphasizing some of the most essential activities and task recommended in the BPR literature, such as changes to customer/market-related business processes, the value-added factor of each business

* Corresponding author.
E-mail address: mohamad.khoshlafz@gmail.com (M. R. Khoshlafz)

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activity, and implementing the correct innovative technology. In fact, top managers should not involve in BPR before making sure about the presence of the essential success factors.

Weerakkody et al. (2011) translated the BPR movement detecting to the field of e-Government induced change in the public sector. BPR characteristics and challenges in their survey were extracted in their survey using normative literature and compared with two case studies from public sector transformation in the UK and Netherlands. Their results show that e-Government-induced change needs a plan for a radical improvement which, in contrast to BPR, was achieved by incremental steps and maintained a high level of participation. According to Sutcliffe (1999), insufficient leadership could be a cause for the high failure rate of BPR projects. BPR implementation needs a top-down, directive leadership style. Nevertheless, it also needs the management of motivated, skilled, independent-thinking people doing non-programmable jobs for which a non-directive leadership style is most appropriated. This generates an inherent conflict for BPR leaders on selecting the suitable style.

Sutcliffe (1999) performed an empirical analyses of the relationship between information system (IS) leadership behavior and BPR outcomes for 30 BPR projects and reported that successful BPR leaders could implement leadership styles that fit the kind of task that requires to be accomplished and the necessities of the people that would execute the tasks. In addition, successful BPR leaders balance their efforts between meeting the people's requirements performing the work and the requirements of the work. Al-Mashari and Zairi (1999) provided a holistic view of the BPR implementation process by reviewing the existing literature associated with the hard and soft factors that help success/failure of BPR implementation. They classified the factors into subgroups, and determined the key factors of success or failure.

Bradley et al. (1995) provided a method, which could be implemented to compare various BPR software tools and then it was used to compare the four BPR software pachanges. Their methodology could provide a basis for evaluating the strengths as well as the weaknesses of other software tools in the BPR domain while helping BPR practitioners to learn on how a specific BPR software tool could "fit" a specific process or industry sector.

AlShathry (2016) studied the current status of BPM implementation among Saudi Arabian firms. Although there was positive favour towards BPM concepts among Saudi organizations, it appeared that the practical understanding of BPM was yet to be matured. One of the important findings from the survey was the relationship between information technology (IT) and business strategy. There was, however, a lack of a holistic view of business processes and its related activities within a firm. Most surveyed firms in this study had either no clear business strategy or it was too complicated to integrate it with BPM initiatives. Some firms had no description process owners for their primary core business processes. Their main BPM attempt was mainly concentrated on the process activities rather than the process output and performance.

Brandon and Guimaraes (2016) examined the relationships between these success factors and the extent to which each BPR-project phase benefited from their presence in banking industry. They reported that some success factors were more or less essential to a specific project phase. Managers may increase the likelihood for overall BPR project success and success in each phase by making sure that the prescribed success factors were in place before they begin or as they pursue the project.

Terziovski et al. (2003) reported on a cross-sectional investigation based on a survey performed on strategic business units within the Australian Financial Services Sector with past BPR implementation. They reported that the proactive implementation of BPR, coupled with concentrating BPR efforts on core-customer business processes were the predictors of BPR success. However, there was no significant and positive relationship between the increased implementation of IT and process cycle time reduction. The implication of these results is that managers have to reengineer their core processes from a customer perspective. They concluded that the key challenges for successful BPR implementation

were changing attitudes and culture, ensuring extensive communications and dealing with resistance to change from middle management.

Reijers and Mansar (2005) performed an overview of heuristic rules, which could support practitioners to develop a business process design that is a radical improvement of a current design and the emphasis was on the mechanics of the process. The different best practices were derived from the literature survey and supplemented with experiences of the authors. To evaluate the effect of each best practice along the dimensions of expense, flexibility, time and quality, they presented a conceptual framework, which synthesizes perspectives from areas such as IS development, enterprise modeling and workflow management. The best practices were believed to have a wide applicability across different industries and business processes and could be implemented as a "check list" for process redesign under the umbrella of diverse management approaches.

Ahmad et al. (2007) examined the BPR critical success factors in higher education (HE) and detected seven factors including teamwork and quality culture, effective change management, etc. Raymond et al. (1998) performed similar jobs on Canadian enterprises. McAdam and Donaghy (1999) studied the perceptions of staff in terms of critical success factors (CSFs) for successful BPR implementation in the public sector. They reported that many of the key CSFs detected for BPR in the private sector were equally relevant to the success of BPR in the public domain including top management support, commitment and understanding of BPR etc. Grover et al. (1994) presented the results of an exploratory study of 59 executives to find out whether or not corporations undertaking IT-enabled BPR projects perceived to be successful, and whether or not the success can be described by an integration of IS with strategy. Their results provided early optimism for this growing phenomenon, resulting that the assumptions hold for most major IT-enabled BPR efforts.

Ranganathan and Dhaliwal (2001) performed a comprehensive survey of BPR practices in Singapore. The study highlighted the status of BPR projects, motives behind their endeavors, the functional areas targeted for reengineering, roles of different organizational members in BPR programs, use of IT in BPR, and the main problems encountered in the efforts of Singapore companies. Their results indicated that about 50% of companies surveyed were engaged in BPR projects, with as many as 37% of the companies indicating their intention to take up BPR projects in the next few years. According to their survey, the main problems encountered by the Singapore companies were insufficient human and financial resources, insufficient IT expertise and capabilities, and insufficient champion for BPR efforts.

According to Khosravi (2016), process orientation, which involves managing organizations based on horizontal end-to-end processes, has increased the quality of products/services, decrease expenses, and make business functions more reliable. Nevertheless, current process orientation techniques may be more radical and destructive, leading to failure in some cases. The existing process management models plan to provide a comprehensive perspective on all of the main activities integrated in process management and strategic alignment, with less concentration on mitigating the risk of failure in their redesign stage.

2. The proposed study

This paper investigates the effects of different factors influencing on the successful implementation of the business process re-engineering (BPR) in Iran. The population of the survey includes all experts who had some expertise in reverse engineering. The sample size is calculated as follows,

$$N = Z_{\alpha/2}^2 \frac{p \times q}{e^2}, \tag{1}$$

where N is the sample size, $p = 1 - q$ represents the probability, $z_{\alpha/2}$ is CDF of normal distribution and finally ε is the error term. For our study we assume $p = 0.5, z_{\alpha/2} = 1.96$ and e=0.05, the number of sample

size is calculated as *N*=386. We have designed a questionnaire and distributes it among 400 randomly selected people and managed to collect 386 properly filled ones. Fig. 1 shows the structure of the proposed study of this paper.

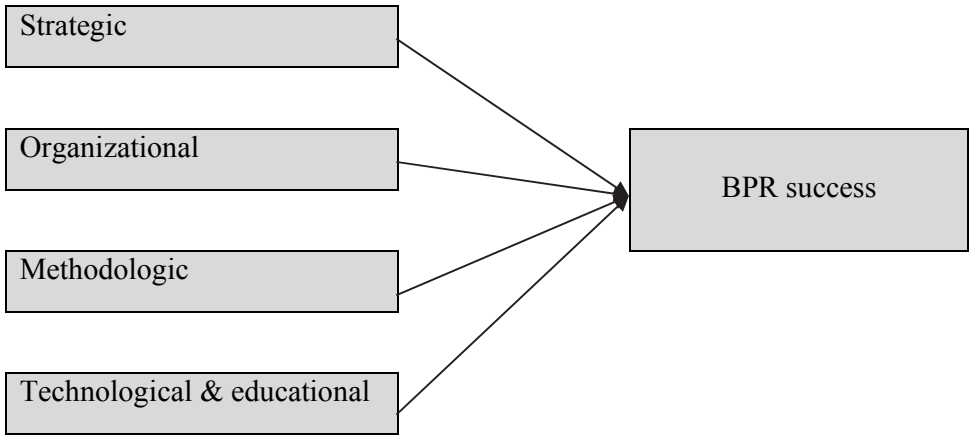

Fig. 1. The structure of the propsoed study

As we can observe from Fig. 1, there are four hypotheses to be examined in this study and we design a questionnaire in Likert scale and distributes it among some experts. Cronbach alpha was equal to 0.71, which is about the minimum desirable level. Moreover, the implementation of Kolmogorov-Smirnov test has indicated that the data were normally distributed and we may use parametric tests to examine the hypotheses of the survey.

3. The results and conclusion

We first use Pearson correlation test to examine the effects of four factors on the success of BPR. Table 1 shows the results of our survey.

Table 1
The results of the implementation of Pearson correlation

Variable	Pearson correlation	Sig.	Results
Strategic	.505	0.000	Confirmed
Organizational	.352	0.000	Confirmed
Methodologic	.267	0.000	Confirmed
Technological and educational	.523	0.000	Confirmed

The implementation of Pearson correlation ratio has confirmed that technological and educational factors marinated the highest effects (r = 0.523, Sig. = 0.000) followed by strategic (r = 0.505, Sig. = 0.000), organizational (r = 0.352, Sig. = 0.000) and methodologic issues (r = 0.267, Sig. = 0.000) on the success of BPR. In addition, Table 2 shows the results of Stepwise regression model.

Table 2
The summary of regression model

Variable	Coefficient	Standard error	Standard coefficient	t-value	Sig.
Intercept	60.116	3.092		21.997	.000
Technological & Educational	.599	.214	.399	3.938	.004
Strategic	.579	.182	.321	3.546	.013
Methodologic	.427	.127	.285	3.202	.007

Adjusted R-Square = 0.29

As we can observe from the results of Table 2, three independent variables influence the dependent variable positively. R-Square is equal to 0.29, which means the independent variables could describe 29% of the changes on dependent variable, BPR success. F-value is statistically significant, which

means the relationship is linear and Durbin-Watson value is within the desirable level, which means there is no autocorrelations among residuals. Finally, all t-student values are statistically significant, which means the relationships of all three variables are significant ($\alpha = 0.05$). The results of this study are in line with other studies reported in the literature (Grover et al., 1994; Bradley et al., 1995; Ahmad et al., 2007; Khosravi, 2016). As Al-Mashari and Zairi (1999) mentioned earlier, many BPR actions may fail without paying attention to many CSF factors and we hope the present study helps practitioners reach success on BPR implementations by taking appropriate attention to technological as well as educational factors.

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