Designing the Model of Effective Factors on Acceptance of Business Process Reengineering (BPR)

Case study: Isfahan Municipality

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Abstract
Business process reengineering (BPR) is a basic rethinking of processes and it’s implementation requires some premises in an organization. Supporting human resource is one of them. Considering lack of readiness in organizations will cause failure in BPR. This investigation will recognize factors that affect acceptance of BPR by authorities and employees in Isfahan municipality by Technology Acceptance Model (TAM). Regarding that TAM is one of the most successful model in acknowledging and accepting technology, Stratified random sampling has been used for collecting data and we have chosen a sample of 165 respondents. Statistical method is Structural Equation Modeling (SEM). Testing model is performed by Lisrel software. The findings of this study confirmed TAM in accepting business process reengineering. In other words, significant effects of perceived usefulness and perceived ease of use were defined.

Keywords: Business Process Reengineering (BPR), Technology Acceptance Model (TAM), perceived Usefulness, perceived ease of use.

1. Introduction
Today, considering intense competition and fast conversions, successful organizations are those that are able to adapt with updated traits. The organization that is not able to change and remain in static mode will disappear. Therefore, managers should create a set of basic transformations not only for themselves but also for their organization in order to survive and to be reflective in dynamic environment surrounding it. Efficiency, creativity and ability of the organization in attending demands and requirements of the customers need a basic review in implementation of activities and processes in the organization.

Managers should transform organizing method so that it can response modern evolution. In other words, reorganizing and redesigning are two important factors for all organizations. The methodology used in reorganization is Business Process Reengineering (BPR). Its aim is compiling and performing plans which are able to review value increasing and strategic processes, systems, policies and structures of the organization. Champy & Hammer introduce reengineering as fundamental rethinking and modern designing of processes for achieving amazing improvement in modern accurate criteria such as price, quality, service and speed.

2. Literature Review
2.1. Business Process Reengineering (BPR)
One of the subjects considered for improvement of the processes and productivity headway in an organization and for evolution of it’s processes is Business Process Reengineering (BPR) which has been regarded according to organization’s attempts for effectiveness, efficiency and flexibility. BPR is an important approach used for evolution of the organizations type. When organizations face high degrees of competition and strain
turn to evolutional approaches so that they can preserve their competitive advantages by saving sources and quick adjustment with environmental challenges. (Kamhawi, 2008)

Business Process Reengineering (BPR) is accurate recognition using process approach to the organization, sketching connection of activities and the implementation process accurately, resource estimation, the total cost and time process. Then correction and optimization of activities’ relationships by means of using methods, information technology and new experiences (Zargar, 1382).

Reengineering means giving up existing processes and approaches and establishing new ways and significant improvement as a huge mutation in performance (Nazari, 1388). The result of implementation of reengineering is accessing more speed and less cost in performance. It also realizes important aims such as top position in the competition, better services to the customer and more value for both organization and customer. (Soori, 1387)

Since 1990s, after organizations’ attention to improve capabilities such as more flexibility, cooperation, teamwork, communication skills, a variety of techniques and equipments have been used in order to improve processes. Many researchers and organizations believe that BPR will lead the organization to unique and great advancement. (Revere, 2004)

One of the most important dimensions of BPR, which is concentrated in this research is tools and principles of reengineering, discussed as requirements of reengineering. Different studies have explained different tools for reengineering. In this study, requirements of reengineering are considered based on different studies in 4 basic dimensions:

- **Organizational culture**: Stimulation of members and organization to accept the changes, education, empowerment, members’ cooperation, suitable ways of encouragement and reward, creativity improvement and establishing effective connections.

- **Organizational structure**: Changing viewpoint to basic components of business requires designing systems and structures that facilitate and encourage new changes performance.

- **Management style**: Considering extension of change dimension a knowledgeable supportive leader can guarantee successful implementation of reengineering.

- **Information Technology**: Recognizing the role of information technology in reengineering, establishing effective infrastructure, Investment and supplying financial sources and appropriate integration of informational systems.

On the other hand, it should be considered that reengineering is a costly and long term process. studies demonstrate that 60 - 80 percent of projects have not been successful (Abdolvand et al, 2008). Risky nature of business process reengineering necessitate more attention to effective factors of BPR’s acceptance. Because evaluation of organization’s readiness for acceptance reengineering, will reduce failure rate and project’s performance risk and doubles positive consequences of activities and reengineering projects.

### 2.2. Technology Acceptance Model

Considering increasing development of technology in new organizations’ environment, its impacts should be considered and based on efficient theories, its acceptance by users should be recognized. In spite of different technologies extension, the impact rate determination and acceptance is considered as forward challenges. Determining technology success or failure, based on technology acceptance rate from users is because control and usage rate is taken place more from technology user. (Rogers, 2005).

In other words, acceptance of members who use this technology is one of the most effective factors on its success, the consequences and positive impacts on organization. Therefore, if individuals resist on using it, desired goals can not be achieved. (Siegel, 2008). Advantages of using each kind of technology are achieved when this technology is applied in an appropriate rate.

Therefore, it is important to knew why users accept or refuse using this technology. If effective factors on technology acceptance by users are identified and apprehended, advanced technology designing systems are provided and probability of users acceptance increases (Moradi et al, 1389).
Therefore, accepting a new technology such as reengineering in the organization is influenced by some factors. Several theories are proposed to facilitate perception of effective factors on users’ behavior in accepting technology. Technology acceptance model is one of them (Plouffe, Hulland and Vanderbosch, 2001). This model is presented by Davis in 1986 for modeling information technology acceptance subject by users in his PhD thesis. This model provides an explanation for effective factors on computer acceptance by users. Figure 1 demonstrates the model process and how it works. This model is based on 2 factors: Perceived usefulness and Perceived ease of use. Perceived usefulness is a shaped perception in users about system’s usefulness so that improving its performance in organization is more beneficial and as a result, it is used more. Perceived ease of use is a shaped perception in users about facilitation of using a system so that less requirement for learning and using the system, will cause more usage. So, more beneficial and facilitated utilizing of a system will probably cause the system’s more acceptance (bagheri et al, 1388). Perceived ease of use also influences perceived usefulness. Independent factors include each factor which influence individuals perception from usefulness and technology ease of use (Davis, Bagozzi & Warshaw, 1989). According to Davis, more research is required in the future to investigate the impact of other factors on usefulness and ease of use.

3. Research model

Proposed research model is shown in figure 2 and then constructs are investigated and hypothesis are described:

3.1. perceived usefulness / perceived ease of use

According to previous descriptions, TAM claims that perceived usefulness and perceived ease of use are two basic factors in describing use of a system (Davis, Bagozzi and Warshaw, 1989).

Hypothesis 1: There is a relationship between perceived reengineering usefulness and cooperation in its performance.

Hypothesis 2: There is a relationship between perceived reengineering ease of use and cooperation in its performance.

3.2. perceived ease of requirements

According to pervious descriptions, considering the importance of reengineering requirements and perceived ease of use, a construct has entered in research hypothesis model titled perceived ease of reengineering requirement.

Hypothesis 3: There is a relationship between perceived ease of reengineering requirements and cooperation in its performance.

3.3. cultural factors / systematical factors / prior experiences of improvement and changes projects in the organization

Cultural factors: Because reengineering includes basic conversion from task units to process teams and successful performance guarantee is empowering employees as a part of reengineering process, its successful performance requires fundamental conversion in organizational culture. It is important because decision making path goes to downliners and more responsibility of the employees is required (R.S. Maull, D.R. Tranfield & W. Maull, 2003).

Systematical factors: Performing conversion in business process without providing appropriate systems and structures is not possible. Business suitable design and description, motivational systems review, organizational change and structural modeling that supports process management can cause reengineering achievement.

prior experiences of improvement and changes projects in the organization: Prior experiences in utilizing similar systems are able to have significant role in drawing employees attention and it can be proposed as a great factor in acceptance.

Hypothesis 4: There is a relationship between cultural factors and perceived reengineering usefulness.

Hypothesis 5: There is a relationship between cultural factors and perceived reengineering ease of use.

Hypothesis 6: There is a relationship between cultural factors and perceived ease of reengineering requirement.

Hypothesis 7: There is a relationship between systematical factors and perceived reengineering usefulness.

Hypothesis 8: There is a relationship between systematical factors and perceived reengineering ease of use.
Hypothesis 9: There is a relationship between systematic factors and perceived ease of reengineering requirements.

Hypothesis 10: There is a relationship between prior experiences of improvement and changes projects in organization and cooperation in its performance.

4. Method

In this study, we attempt to identify and introduce factors that are effective in reengineering acceptance by employees, experts, and managers in Isfahan municipality by using technology acceptance model and components including perceived usefulness and perceived ease of use and independent variables by process reengineering so that the organization can provide reengineering performance path available by the results of this study and provide suitable background for efficiency improvement. Considering the aim of this study, the population consists of 615 employees, experts, managers, and presidents of Isfahan municipality including 8 assistants. Stratified random sampling was used (in which 1 out of 8 assistants is chosen). First, to determine sample number and size, a preliminary study was done by distributing 30 questionnaires and by calculating preliminary sampling variance in 95% level confidence, minimum sampling became 120 individuals. 200 questionnaires were distributed and 165 questionnaires were returned. Therefore, 165 questionnaires were analyzed. Validity of the questionnaire is confirmed by experts and its reliability is calculated based on Cronbach's Coefficient Alpha. It was 83% for the initial sample. The questionnaire is distributed based on estimated sample size. The questionnaire, which is one of the most effective tools for collecting data includes general questions about participants' gender, age, education and job experience. It contains 39 main items that investigate 7 model constructs by using Likert spectrum.

5. Data analysis

5.1. Investigation and description of participants' public and demographic characteristics:

Descriptive statistics has been used to investigate and describe general specifications such as gender, age, education and job experience. Table 1 represents participants general identifications.

5.2. Structural Equation Modeling (SEM)

Statistical method used in the present study is Structural Equation Modeling, that is, a comprehensive statistical approach to test hypothesis about the relationship between observed variables and latent variables. Structural Equation Modeling provides methods for testing theoretical models accurately based on hypothesis about observed and latent variables that correlate so that observed relevance between variables could be described targeted. As the study’s goal is to describe a model for investigating effective factors on process reengineering acceptance and the impact of several variables on each other is investigated, Lisrel software is used. This software is available for parameter estimation, model goodness of fit of structural equation with final variables. The most significant stage in SEM data analysis is model fitting evaluation to data. Before any investigation among constructs, fitting model to data should be confirmed. There are several fit indices for this purpose. Table 2 demonstrates criterion for model fitting evaluation with the recommended amount for each one.

5.3. Research hypothesis test

After studying and confirming the model, the model hypothesis is evaluated. T statistic is used to show significance of model parameters. This statistic is achieved from fraction of each parameter's coefficient to its error standard deviation. It should be more than 2 in T-test so that the estimations would be significant statistically. All of the model hypothesis are confirmed except hypothesis 3, as shown in figure 2.

6. Discussion and conclusion

This study attempts to use TAM to study business process reengineering acceptance. In other words, acceptance rate and attitude in cooperating in business process reengineering performance in Isfahan municipality by TAM was examined. Significant impacts of perceived usefulness and perceive ease of use were determined which confirm Davis findings. Totally, the results of this study shows:

There is a significant relationship between perceived usefulness of business process reengineering and cooperation in its performance. It means that the more perception of advantages of process reengineering in employees’ mind, the more their cooperation in implementation. In other words, because of technology functions, employees tend to cooperate. Therefore, extended description of process reengineering profits by
managers and reengineering teamwork, will be more effective in increasing peoples’ participation in implementation plan.

There is a relationship between perceived reengineering ease of use and cooperation in its performance. It means that the more perception of process reengineering ease of implementation, the more their cooperation in performance. Therefore different solutions can be administered. Simpler process designing, standard observance and designing guidance, empowering and extending hardware equipments for employees’ comfort are some of the solutions.

Another important construct in this model is cultural factors that has great effects on three meddler variables. Therefore, the stronger cultural beliefs and values in an organization, the more perceived usefulness and ease of use in reengineering performance. Organizational managers should proceed to empower, educate, boost knowledge, cooperate individuals and establish professional conferences. Because lack of education and skill in employees and educational programs will cause different problems in conversion.

Systematical factors also have significant relationship with three meddler variables. Therefore, recognition and review in systematical factors such as occupational relationships, systematic complexity, access to professional space and utilization of experts in system analysis for describing advantages of reengineering and establishing logical cognition about its usefulness in organization provides circumstance for reengineering acceptance. It is also suggested that before reengineering performance, organization provides main information from system analysis experts, bachelors of business development, planning experts, and their experience and proficiency and take advantage of them about explaining ease of reengineering implementation.

The results also demonstrate that prior experiences of change and improvement projects in organization to cooperate in implementation of reengineering have significant effect. In other words, prior experiences in utilizing similar systems can have an important role in attending employees. Because if the organization proceeds to better implementation of the projects and have employees cooperate in them, it has created a joint experiences inside organization. If the experiences in previous projects have been successful, it would have been effective in positive attitude toward cooperating in next projects.
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Annexure

Figure 1: Technology Acceptance Model, Davis 1989.
Figure 2: Proposed model by Reengineering
Table 1: Demographic Characteristics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Distribution</th>
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<tbody>
<tr>
<td>Gender</td>
<td>Male:113 (31.5%)</td>
</tr>
<tr>
<td>Age</td>
<td>20-30 years: 50 (30.3%)</td>
</tr>
<tr>
<td>Educational level</td>
<td>Under BA: 18 (10.9%)</td>
</tr>
<tr>
<td>Job experience</td>
<td>1-5: 52 (31.5%)</td>
</tr>
</tbody>
</table>

Table 2: Result of the model goodness-of-fit

<table>
<thead>
<tr>
<th>Fit index</th>
<th>Recommended Criteria</th>
<th>Result in this study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-square/Degree of Freedom</td>
<td>&lt;3</td>
<td>2.03</td>
</tr>
<tr>
<td>P value</td>
<td>&gt;0.05</td>
<td>0.09</td>
</tr>
<tr>
<td>GFI (goodness-of-fit index)</td>
<td>&gt;0.90</td>
<td>0.91</td>
</tr>
<tr>
<td>AGFI (adjusted goodness-of-fit index)</td>
<td>&gt;0.90</td>
<td>0.91</td>
</tr>
<tr>
<td>RMSEA (root mean squared error of approximation)</td>
<td>&lt;0.05</td>
<td>0.006</td>
</tr>
<tr>
<td>CFI (comparative fit index)</td>
<td>&gt;0.90</td>
<td>0.91</td>
</tr>
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