

## Innovation Models and Business Process Redesign

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### Abstract

Business Process Reengineering (BPR) is a paradigm that is used by many organizations to survive in the competitive era. However, creative design of the business processes is a critical phase and the organization should prepare the ground for innovation in this phase. Innovation helps organizations to use the BPR concept efficiently. This paper reviews the BPR methodologies and innovation concepts and models and presents a business process redesign framework based on the innovation models using Dubin's methodology. This brings innovation concepts to the world of business process reengineering. In the proposed framework, external and internal factors enforce the organization to accomplish a BPR project. Preparing an organization for innovation makes a new environment that drives employees to innovate and look forward to new processes. This is crucial for BPR projects where employees should make significant changes in jobs, workflows and IT, and increases the chance of BPR projects success.

**Key words:** Innovation; Business process redesign framework; Dubin's methodology

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### INTRODUCTION

Nowadays organizations are exposed to emerging concerns like fast and unpredictable changes, customers' changing taste, expecting a high-quality product, and competition across the world. They take different shapes to keep their position in the global market and stay alive. Many organizations have to choose either to fail or doing fundamental changes in many aspects including their processes, the latter is named Business Process Reengineering (BPR). Through BPR, organizations face fundamental innovative changes in order to get dramatic improvement in the critical success factor. Reengineering, according to Hammer and Champy (1993), means "tossing aside old systems and starting over. It involves going back to the beginning and inventing a better way of doing work". Lee and Dale (1998) believe that the reengineering literature is often associated with large-scale innovation and high-risk changes. Al-Mashari, Irani and Zairi (2001) describe that there are many factors that prevent the effective implementation of BPR, including limited innovation. Also Kim and Jang (2002) believe that BPR pursues simultaneously multiple improvement goals such as quality, cost, lead time, flexibility, outcome, innovation and accuracy. The heart of BPR project is redesign stage that should break old structures and processes and define new processes in an innovate manner. However innovation models have not been used in the BPR literature extensively.

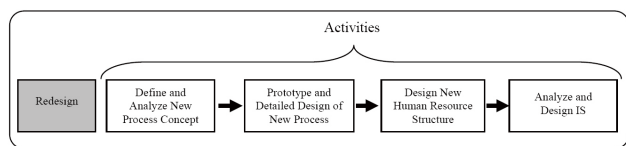
Hamel (2006) defines innovation as a marked departure from traditional management principles, processes and practices, or a departure from customary organizational forms that significantly alters the way the work of management is performed. Hesselbein et al. (2002) believe that innovation is "a change that creates a new dimension in performance". Hammer and Champy (1993) estimate that as many as 70 percent of BPR projects do not achieve the dramatic results they seek. Although, some authors such as Al-Mashari et al. (1999) have pointed that

the failures are related to change of management systems and culture, management support, organizational structure, BPR project management, and IT infrastructure, but, many other soft issues such as innovation in the redesign process is not sufficiently discussed. This paper seeks to introduce an integrated process redesign and innovation framework. The framework shows how and where the innovation techniques for redesigning new processes can be used.

## 1. THEORETICAL FRAMEWORK

### 1.1 Business Process Redesign

The main concern of BPR is rethinking and redesigning the business process for obtaining sustained improvement in quality, cost, service, lead time, flexibility and innovation (Hammer and Champy 1993, Gunasekaran and Kobu, 2002). Several models are proposed for undertaking BPR; however, there exists no unified methodology for BPR. Some of the famous methodologies for BPR are Klien (1994), Furey (1993), Guha (1993), Davenport and Short (1993), Harrison and Pratt (1993), Barrett (1994), Obolensky (1994) and Kettinger (1997). The purpose of using BPR methodology should be redesigning new processes and satisfying the current needs of the organizations. This step in the Kettinger’s model has four main activities that are shown in Figure 1. It is believed that the new processes are accomplished by devising process design alternatives through brainstorming and creativity techniques along with other well-know techniques that enrich this stage.



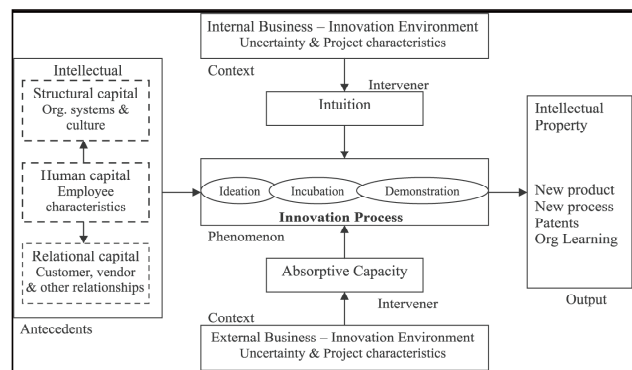
**Figure 1**  
The Redesign Step of Kettinger and Grover’s Model (1997)

### 1.2 Innovation Concepts, Models and Techniques

Innovation as a descriptor is so widely used that its reference has become somewhat generic. Organizations use innovation as a term to describe many things, and definitions of innovation found in the literature vary depending on the context and scope of the analysis. Some definitions are quite general – for example, to have creative employees or be market leading, and others quite specific – referring to the types of behaviors and specific roles – in the form of culture, to be engaged by employees. It is argued that innovation is: “The intentional introduction and application within a role, group or organization of ideas, processes, products or procedures, new to the relevant unit of adoption,

designed to significantly benefit the individual, the group, organization or wider society” (West and Farr, 1990). Hamel defines innovation as a marked departure from traditional management principles, processes and practices or a departure from customary organizational forms that significantly alters the way the work of management is performed (Hamel, 2006).

Process innovation means performing business activities in a new way. Process innovation is generally a discrete initiative and it also implies the use of specific change tools and technology for enterprise engineering and transformation of business processes (Davenport, 1993). Innovation is usually concerned with creation and development of new ideas and solutions and it also has some well-known techniques that help the organization and people for thinking better. Using these techniques depends on the situation of the organizations and peoples confronting. Innovation models usually focus only on one innovation aspect. For example, the Daft’s innovation process model (1984) emphasizes the innovation stages, and the Narvekar and Jain’s conceptual model of innovation (2006) emphasizes the innovation process, where, organizations should pay attention to two elements: Human resource, and internal and external environment (Figure 2). They also argue that the innovation process has three stages: Ideation, Incubation and Demonstration, which are followed in all innovation processes.



**Figure 2**  
Conceptual Model of Innovation (Narvekar and Jain, 2006)

Innovation has some techniques and methods which can help the people and organizations to encourage finding new things and ways. Some well-known techniques are Brainstorming, Synectics Model, SCAMPER (Substitute, Combine, Adapt, Modify and Magnify, Put to other uses, Eliminate, Rearrange), Delphi, Nominal Group, Morphological Analysis, Speculative Excursion, Bionics, Six Thinking Hats and Lateral Thinking. Using these techniques leads to new ways of doing jobs or redesigning new processes which the organizations try to find in the process redesign. These techniques are used depending on the situation that organization and people

confront. Brainstorming is a group activity and process for developing creative solutions where each participant shares his ideas and was recommended by Kettinger et al. to produce original ideas by setting directed questions about probortunity.

## 2. ELEMENTS OF BUSINESS PROCESS REDESIGN FRAMEWORK

Dubin(1978) provides an eight staged theory building methodology which is relevant for applied fields such as management, marketing, and organization theory. The eight stages of Dubin's theory building are:

- (1) Units (i.e., concepts) of the theory,
- (2) Laws of interaction (among the concepts),
- (3) Boundaries of the theory (the boundaries within which the theory is expected to apply),
- (4) System states of the theory (conditions under which the theory is operative),
- (5) Propositions of the theory (logical deductions about the theory in operation),
- (6) Empirical indicators (empirical measures used to make the propositions testable),
- (7) Hypotheses (statements about the predicted values and relationships among the units),
- (8) Research (the empirical test of the predicted values and relationships).

The first five stages of this methodology represent the structure components of Dubin model and the other three stages represent the process of empirical validation. Although theorists have to consider the entire scope of Dubin's model for effective theory building, but theory building and empirical research are often separated and each of them is conducted as a distinct research effort. This section describes the business process redesign framework using the first five stages of the Dubin methodology.

### 2.1 Units of the Theory

The units of the model are the concepts and the building blocks from which the model is constructed. To determine the concepts, we reviewed the literature of BPR and innovation.

#### 2.1.1 Units of the Model: Motivations of Internal and External Environments

Fast and unpredictable changes in internal and the external environments affect the organizations to move and find new ways for doing better work. Changes cause the organizations to do BPR in an innovative manner. Although the internal and external organizational environments are closely coupled, they should be separated. Human resource, communication, organizational structure and culture, internal innovation and laws, researches are the most important internal motivations which push the organizations to use

innovation methodologies and techniques in the processes redesign. Customers, competitors, stockholders, suppliers, salespersons, governmental politics, laws, new technologies and external innovations are the external motivations that warn the organizations about new changes in the business environment. It compels organizations to change old processes for confronting with global competition.

#### 2.1.2 Units of the Theory: Implementation Phases and Activities

According to the innovation process the business process redesign has three main phases Ideation, Incubation and Demonstration (Narvekar et al., 2006). New ideas are formed in the ideation phase, grew up in the incubation phase, and then demonstrated in the final phase. These phases are elaborated in six stages:

- Recognizing of need for processes innovation

The first step is the need for innovation. This is not achievable unless the employees are involved in the inefficient processes that motivate changing the processes. Employees should understand and be convinced that the old processes neither help the organizations to achieve its goals nor satisfies the customers. The organization must provide an innovating environment, and the managers have to trust the employees in thinking about new process, ideas and changes. The employees need to be acquainted with innovation techniques and constitute a creative team.

Kettinger et al. (1997) argue that three innovation techniques can be used in the first step of the redesign: Brainstorming, Delphi, and Nominal group. Delphi or Nominal group techniques are suitable in situations where good ideas exist about new processes. It is also believe that the Nominal group technique is not suitable at the beginning of the redesign stage. An important innovation technique that can overcome the obstacles of innovation is Lateral thinking, because it helps the employees to create new mental structures. Lateral thinking involves discarding the obvious, leaving behind traditional modes of thought and throwing away preconceptions that are very important in redesigning new processes (de Bono, 1992).

- Thinking about old processes

Processes should be investigated regarding their theoretical foundations. Speculative Excursion technique helps people to think about problems in the old processes. Brainstorming is also an important technique that helps people to think about new processes. Synectics techniques are also used for expanding new processes ideas. These techniques provide the base for thinking about problems of the old processes.

- Designing and analyzing new processes

The first technique that can be used in this stage is Brainstorming; which encourages people to come up with new ideas. SCAMPER is also vital for developing ideas about the new process. In SCAMPER people have to

answer some questions about the new ideas. For instance, people should answer how they can replace some things, someone or some processes, and also how they can combine or develop new processes. They also have to think about mixing, modifying, eliminating, rearranging, combining and adapting new processes which facilitate designing new processes.

After redesigning new processes, they need to be analyzed by Delphi technique. It is important to receive experts' opinions about new processes to validate the new design. After analyzing, the processes may have some problems that need to be fixed by Six Thinking Hats (STH) method. The new process design needs feasibility study and then reviewing required jobs, structures and new resources.

- Defining details and communications among new processes

The relationships among new processes and between old and new processes should be investigated. Morphological Analysis helps to define new connections and communications between new processes. SCAMPER technique can be used for integrating new processes; and finally they should also be accredited.

- Designing new structure and systems

Redesigning processes, changes the other organizational dimensions. The organization need to design new structures based on the new processes by Morphological Analysis and Six Thinking Hats (STH). Morphological Analysis can also define new information systems (IS) by studying and analyzing details of new processes. It is also important to use Delphi technique for designing new jobs and responsibilities.

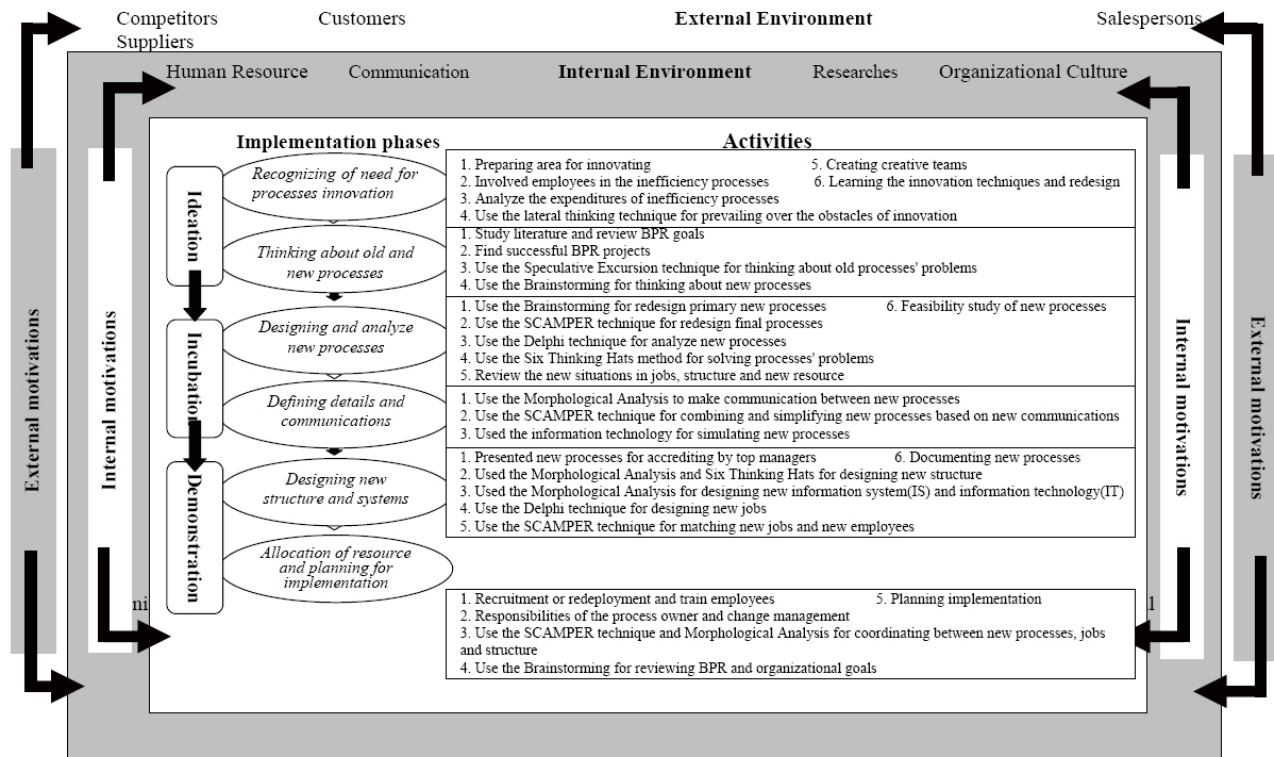
- Resources allocation and planning for implementation

After redesigning new processes and proposing required changes in the organization, the employees should be recruited, redeployed, and trained for the new processes' need. Also the organizations need to identify the responsibility of the process owner and need to promote change management. SCAMPER technique and Morphological Analysis can be used for aligning new processes, jobs and structures. Finally, new processes might be able to provide new opportunities in the business environment that leads to revising organizational goals by Brainstorming technique.

## 2.2 Laws of Interaction

The relationships among the concepts (units) of a theory (model) are described in the theory's laws of interaction (Dubin, 1978). The laws of interaction show how changes in one or more units or phases of the theory influence the remaining phases. We posit the relationships outlined in Figure 3. This framework shows how different units of the proposed framework are integrated. We define model's internal and external environment that motivate the organization to improve the processes. Then we use the innovation processes for defining the main stages of redesign process. Based on the redesigning stages of BPR project, six phases of this framework are supported by the innovation process. Details of activities for each implementation phase are elaborated too. The following interactions between the units are hypothesized:

- The internal and external environments, being the motives of the change in the organization, influence the success of redesign process. (Daft, 1984; Al-Mashari and Zairi, 1999).



**Figure 3**  
**Business Process Redesign framework**

- BPR and innovation are highly affected by succeed or failure of each other.
- Using redesign techniques are essential in the redesign process.
- Human resource is the main factor of innovation and redesigning new processes because they push the organization toward creative processes (Willmott, 1994; Kettinger et al., 1997).
- According the BPR methodology and innovation process, manner and succession are important in framework (Kettinger et al., 1997).

**2.3 Boundaries of Framework**

Dubin (1978) defines the boundaries of a theory as describing the domain over which the theory is expected to be applied. “Redesign step” is the most important step in the BPR methodology and innovation is the main requirement in process redesign success. According to the Kettinger et al. (1997), the framework will start when the diagnose stage is completed.

**2.4 System States**

Dubin (1978) defines a system state as a state in which all the units of the system take on characteristic values that have persistence through time, regardless of the length of the time interval. A system state that accurately represents a condition of the system being modeled has three characteristics: (a) Inclusiveness, (b) Persistence

and (c) Distinctiveness. We believe that our framework satisfies all three requirements, because: (a) it includes all the important units of the system that are identified in previous BPR methodologies, (b) the relationships between all the units described in Fig. 3 are long-lasting relationships, and (c) there is no overlap in values between any of the units and all units take on unique values for that system state (i.e., each unit can be assigned as a unique value).

**2.5 Propositions**

Propositions of a theory are the logical deductions about the theory in operation. Because they are statements that are logically derived from the theory, propositions can be subjected to empirical testing (Dubin, 1978). We defined propositions for our business process redesign framework as below:

Proposition 1: Using the proposed framework increases the chance of BPR project success.

Proposition 2: Acquainting employees with innovation concepts and techniques provide suitable areas for redesigning processes

Proposition 3: Existence of internal and external motives increases the application of innovation techniques in the redesign stage.

Proposition 4: Employees are the main factor to use the innovation techniques in redesign process.

The last three phases of Dubin's methodology are used to conduct empirical research. For this activity, the researchers need to assess the proposed theory in the real world. Propositions can be tested in a quantitative study, using an ex-post facto survey design, involving a sample of successful and unsuccessful BPR projects.

## CONCLUSION

Business process redesign is an important step in BPR project, and innovation is the most relevant concept in this stage. However, their models, concepts, and methodologies are separated. Innovation process is a crucial issue for preserving organization, but it has not been implemented in the BPR projects yet. The proposed methodology overcomes this problem. This paper shows how innovation concepts and techniques are used in the process redesign. Three stages, six steps and 25 activities are introduced to prepare a practical roadmap for advisors and researchers. This framework helps the organization to use all the employees in the redesign processes based on the innovation concepts and cultivates the organization's culture for agility and effectiveness.

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