

# Presenting a Framework of Reengineering Methodology for Organizational Diagnosis and Process Improvement (Case Study: Industrial Estate Company of Kurdistan)

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## Abstract

Nowadays organizations encounter serious challenges such as drastically changes in business environments, increasing competitions, as well as expanding markets and different needs of customers, it seems that having a deep conception of the current processes of organizations and enhance them is a must for both service and production companies to survive in such competitive and complex environment. One of the modern approaches for improving organizational processes is business process reengineering. In this study, the current condition of Industrial Estates Company of Kurdistan (IECK) has been studied and the key processes of IECK concerning the industrial units have been determined. Then, the problems related to implementation of these processes have been identified through the comments of experts of the organization and industrial units which are settled in Industrial Estates, in addition to investigating the operation of these processes. Afterwards, those processes which have invoked the most dissatisfaction in customers or industry holders have been evaluated through business process reengineering (BPR) methodology; subsequently, some improvement methods have been proposed to remove, modify, review, and change these processes.

**Keywords:** Organizational Diagnosis, BPR, Process, IECK, Improvement.

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## Introduction

Industrial estates corporation is constantly learning and changing in order to survive, develop, and progress in competitive environment. It seems that the present methods no more are efficient, because most of them are on the basis of task-oriented policies. Nowadays, it is obviously observed that the following factors result in reviewing these methods and systems: national and international environmental changes, changes in public expectations, increasing competition over public resources, criticism of financial and structural condition of education, reliance on government budget, reduction of tenure responsibilities, creation of strong policy-making groups, bureaucracy decrease, waste time reduction, attention to customers and revering people, and development of information and communication technologies.

Management experts and thinkers have taken widespread notions like comprehensive quality management, continuous improvement, organizational transformation, and determining the correct size of organizations to improve the function of organizations. The common purpose of all these approaches is a change in the way of doing works in order to improve organizational function. In line with this, one of the management innovations which have got a scientific and functional place for itself is business process reengineering (BPR). It is promising that through this approach we can make a fundamental development in the function of organizations via basic changes in primary processes. The concept of reengineering is originated from the successful experience of business and industry in implementing Deming's principles. Deming's management principles were used to reconstruct Japan after the war. His principles is based on total quality management (TQM) philosophy and requires evaluation of process involving supplier to customer in order to achieve maximum efficiency and customer satisfaction. Reengineering presents an opportunity to a basic investigation of structure, processes, and communications in organizations. Although BPR has been defined differently, all different definitions emphasize using IT to redesign work processes for organizational changing. This specifies the basic elements of BPR which distinguish it from other management tools.

## An Overview of Kurdistan Industry

Unfortunately Kurdistan industry sector does not have an appropriate place in Iran. Nevertheless, the existence of some mineral deposits has led to development of the related industry in the province. Among different industry subsectors in Kurdistan the maximum value added belongs to food and beverage industry and then the production of nonmetal mineral products and textile industry. In fact, the above three subsectors make up more than 70% of the total value added of Kurdistan industry.

### *Problems and drawbacks of Kurdistan Industry*

This study reveals that Kurdistan Industry suffers some problems, which have been summarized as follow:

- Most industries in the province are not export-oriented; they are merely to satisfy internal demands

- Low amount of investment in industry and a great difference between industrial development in Kurdistan and its average in Iran
  - Lack of usage of the potential resources of the province like water and agricultural products resources for industrial development in Kurdistan
  - Unavailability of the necessary software and hardware infrastructures to develop industrial export
    - Low productivity and high costs
    - Low efficiency of industry personnel
    - Lack of coordination and proper connection amongst industry sector and agriculture and mining sectors
    - Lack of proper connection between industrial units and in coordination with other industries
      - Machine obsolescence and the resulted maintenance
      - Lack of thorough use of the available production capacities
      - Ignoring the necessary standards in production of export products

#### *Identifying the Current Condition of Kurdistan Industry Based on Two-Digit ISIC Codes*

The condition of small and medium industries in Kurdistan was investigated according to the obtained information from the organization of industry and mine and Industrial Estates Corporation of Kurdistan (IECK); the result of this investigation is separated according to two-digit ISIC codes and is illustrated in the following table. In process reengineering and fault diagnosis in industrial units it should be noted that because of the diversity of industrial units of IECK, there will be more emphasis on the codes which are more important and greater in number

Table (1): The condition of IECK as separated by ISIC codes

| Row | 2-digit codes  | Industrial estates |            |            |       |       |        |         |       |         |            |           |
|-----|--|--------------------|------------|------------|-------|-------|--------|---------|-------|---------|------------|-----------|
|     |  | Sanandaj 1         | Sanandaj 2 | Sanandaj 3 | Sagez | Bijar | Qorveh | Kmyaran | Baneh | Marivan | Qveh Stone | Sum total |
| 1   | Food, beverage, and tobacco industry                               | 53                 | 27         | 0          | 35    | 6     | 9      | 7       | 0     | 0       | 0          | 137       |
| 2   | Textile, apparel, and leather industry                             | 17                 | 0          | 13         | 2     | 4     | 5      | 2       | 0     | 0       | 0          | 43        |
| 3   | Wood and wood products industry                                    | 0                  | 0          | 0          | 0     | 0     | 0      | 0       | 0     | 0       | 0          | 0         |
| 4   | Paper, carton, printing and binding industry                       | 0                  | 0          | 0          | 0     | 0     | 0      | 0       | 0     | 0       | 0          | 0         |
| 5   | Chemical industry  | 72                 | 29         | 23         | 29    | 15    | 13     | 9       | 0     | 0       | 0          | 190       |
| 6   | Nonmetallic mineral products industry except oil and coal products | 11                 | 2          | 11         | 3     | 7     | 4      | 1       | 0     | 0       | 0          | 39        |
| 7   | Basic metals industry  | 60                 | 18         | 32         | 14    | 8     | 8      | 9       | 0     | 0       | 0          | 149       |
| 8   | Machinery, equipments, tools and metal products industry           | 11                 | 2          | 4          | 3     | 0     | 0      | 0       | 0     | 0       | 0          | 20        |
| 9   | Cellulosic   | 21                 | 8          | 17         | 6     | 4     | 2      | 2       | 0     | 0       | 0          | 60        |

## **Process and Process Approach, Diagnosing Organizational and reengineering Faults**

### *Definition of Process and Process Approach*

Process is a series of successive activities and measures during which inputs are transformed into the required outputs and from which the value added is obtained. Process approach is very effective on an organization. In this approach, it is necessary that the traditional and vertical management will be shifted to horizontal organizational relationships; this, in turn, asks for an earnest commitment and a special planning for success. When the strategic objectives and key factors of success and the way to achieve them are recognized and the processes or key processes are defined, the organizational structure should be designed and created according to the processes in two categories of support and business processes. In the designing stage, the desirable condition of reengineering, organization's limitation, and workflow which is basically different from the current condition is redesigned. Recreation of the desirable state is one of the obscurest and the most difficult stages of reengineering (Sepehri, M., 2006). In each level of the process (macro-level process, sub-processes, trends and obligations) the related measurement indices are needed for its evaluation. These indices are designed in a way that complement each other and form an evaluation system. Indices and measures include two types: indices related to the results and products and internal indices of processes; the first group focuses on customers' needs and the second group mainly reveals needs of the organization itself. When the key processes were identified and documented it is important to manage them and deliver reviewing strategies for them. Sepehri (2006) believes that the focus and priority of investigation and transformation should be based on the priority of the key processes. He further states that the large-scale processes of an organization can be divided into six groups, each group involving few processes in its level. These are shown as figure 1.

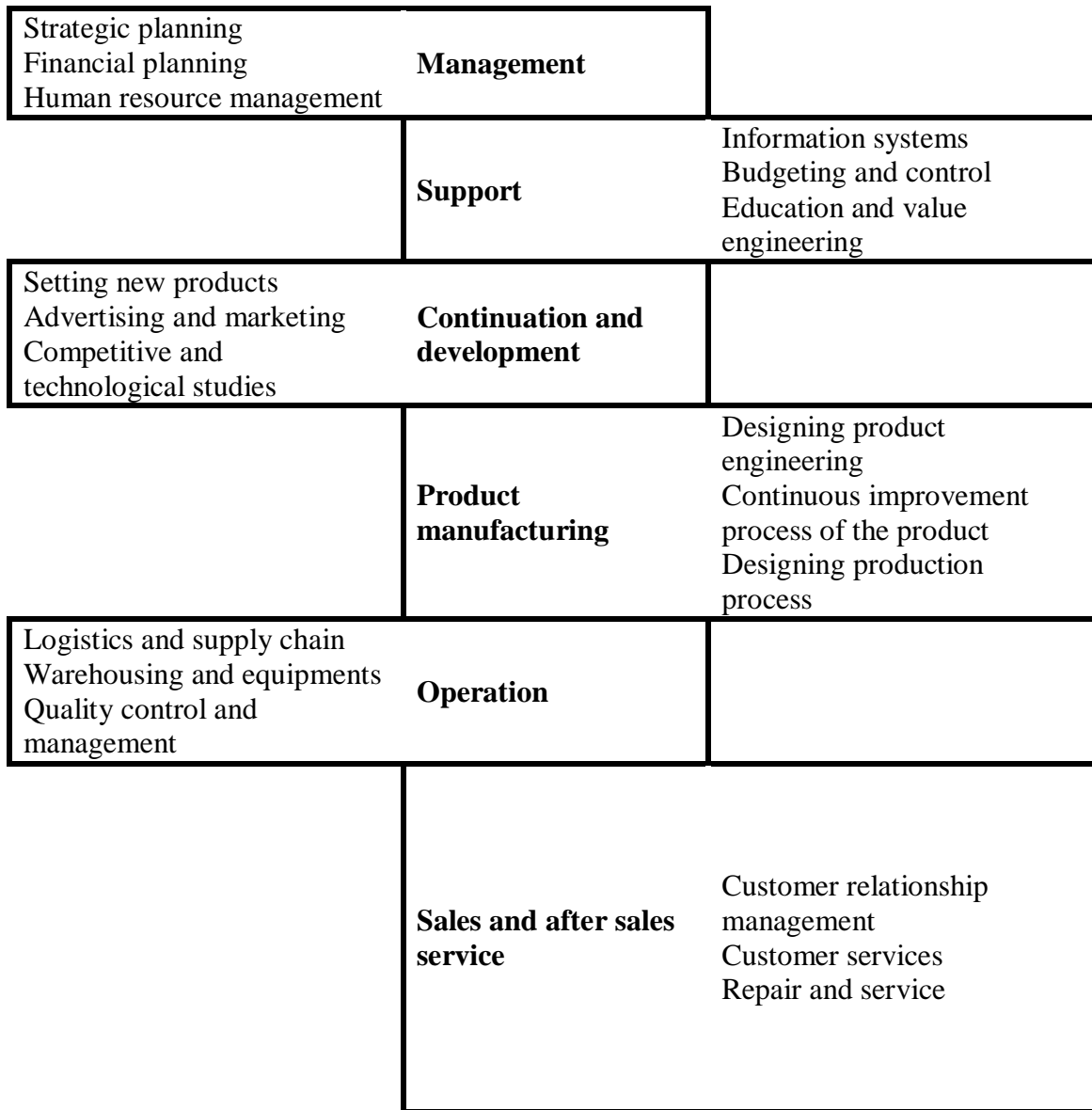


Figure 1. The main processes of organizations

### Organizational Fault Diagnosis

Organizations in each chain are trying to improve their operational structures. There are two main important questions to be asked in this regard; first, which improvement opportunities are there? Second, with regard to the present limitations, which opportunities will create more value for the organization? In line with this, fault diagnosis and answering to questions will help the organization to obtain value and improve (Gower, J. G., 2003)

The start point for transformation in organizations understands the current condition of the organization. This understanding needs an appropriate model. Correct attention and timely cognizance of the symptoms of the current problem, which reveals

organizational failures, asks for a sensitivity and obligation to find and understand the roots of these failures. Addressing the causes of basic problems of an organization is an important step to transform and improve organizational condition. Fault diagnosis is the process of finding the symptoms of the problem, identifying its origins, and proposing effective strategies to solve the problem. Another function of fault diagnosis is thorough investigation of the basic communication between the problem with overall objectives and the results of organization's function and also the potential capacity of the enterprise to create changes and effectively solve the problem.

Organizational fault diagnosis process does not involve problem solution, but, it proposes a strategy for solving the problem. Moreover, fault diagnosis might cause the problem to be recognized as unsolvable or be specified as a problem which does not worth spending time and money on. Accordingly, fault diagnosis involves an active and effective process to precisely identify symptoms and failures, and to propose effective solutions to help eliminate or decrease problems. (Khademi et al., 2005).

The stages of fault diagnosis process are briefly as follows:

- Problem identification
- Identifying the signs of the problem
- Explaining problem complications
- Finding the reasons that caused the problem
- Presenting effective strategies

(Khademi et al., 2005) have identified the most important complications and weakness points of Iran Wood Technology Inc. as decrease in personnel's efficiency and productivity, lack of a distinct way for development in an organizational level, lack of opportunities for learning and developing work skills, low job security, low customer satisfaction, lack of accounting of final cost for sale, and lack of documentation systems for information. Eventually, the introduced some prioritized strategies for the crisis.

The most important benefits of fault diagnosis projects are:

- Determining organizations' weakness points and complications
- Determining strong points and the available opportunities
- Identification and analysis of the present environment to study organization's function
  - Determining scientific strategies to solve the problems
  - Defining applied instructions and projects
  - Preventing organization's financial resources waste in non-functional projects
  - Reduction of ineffective instructions costs

When the basic processes of the organization were identified, we should determine the processes in which there are problems; we should also know about the current condition and the desirable state. In other words, the causes to the problems should be identified and based on that some improvement opportunities should be determined. As there might be so many opportunities, it is not reasonable to practically deal with them



all. Accordingly, the improvement opportunities should be prioritized according to some special criteria so that high priority opportunities are first dealt with.

### **Business Process Reengineering**

Reengineering is necessary for salient competitiveness of organizations ( Guimaraes, T., 1999). Process reengineering is fundamental rethinking and new and basic designing of processes in order to achieve prodigious development in some sensitive criteria like cost, quality of services, and speed. Hammer & Champy presented this model in 1993 and called it “the fundamental reconsideration and radical redesign of organizational processes in order to achieve drastic improvement of current performance in cost, service and speed”. Reengineering causes outstanding and fundamental development in the function of organizations through principal changes in organizational dimensions like strategies, programs, organizational systems, manpower, and organizational technology. There are three driving forces causing these changes. Hammer & Champy (1993) have remarked that these forces work according to competitive advantage and have specified them as customers, change, and competitors. Reengineering of organizations is a holistic approach during which an organization’s competitive strategy is linked with its internal processes and employees. This connection is held by using newest IT( Hammer & Champy, 1993)

The scope of changes in reengineering requires a factor which is necessary for the success of its programs; the factor is executive leadership with a real insight (Hammer & Champy, 1993).

In industrial units reengineering projects, (Guimaraes, 1999) believes that when the objective, benefits, and the impact of the project on the function of an organization is clear, the project will be successful and the risk of its failure comes to a minimum. the critical effective factors on the success of process reengineering have been identified as the need for change, good infrastructure for change, active participation of personnel, and decreasing resistance to change.

In a reengineered organization, processes, occupations, managers, and values are four important and connected factors which should be considered in form of a cycle as follows:

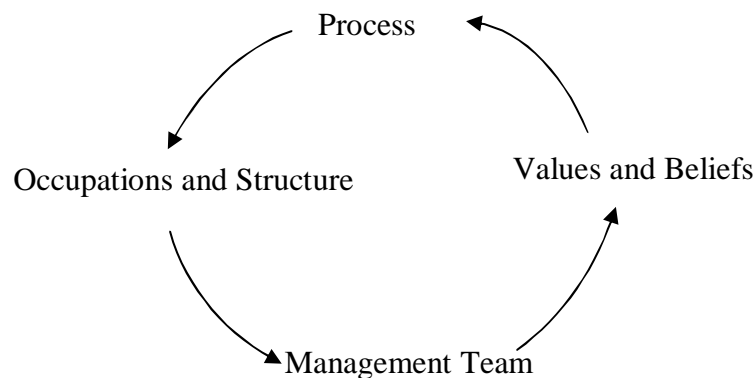


Figure 2. The cycle of a reengineered organization’s components



The above figure illustrates the outlook of Hammer & Champy (1993) towards process reengineering. The key factor in this cycle is the interaction and consistency of these four factors which are directly related to failure and success of an organization. The process defines the structure, occupations and structure define the appropriate management system, management system forms employees' values and beliefs towards the organization, and, finally, the values and beliefs create the function and support processes.

(Cheng et al., 2011) have developed their knowledge management based BPR model for construction companies. They believe that integrating knowledge management with routine operations of the processes not only improves weak/complicated processes of these companies but also increases business competitive advantage and enhances their innovative quality.

(Ozcelik, 2010) investigated the effects of BPR on the three variables of workforce productivity, capital efficiency, and return on equity in large US enterprises; he concluded that the function of these companies improved after introducing BPR while it was unchanged when BPR was implementing.

### *Reengineering Methodology*

The most important innovation of this methodology which is developed for process reengineering in the organizations of developing countries is applying four rethinking stages on objectives, process design of the current condition, pilot study, and participation in reengineering of inter-organizational processes which were absent in the previous recognized models (Iran Management and Productivity Study Center, 2001).

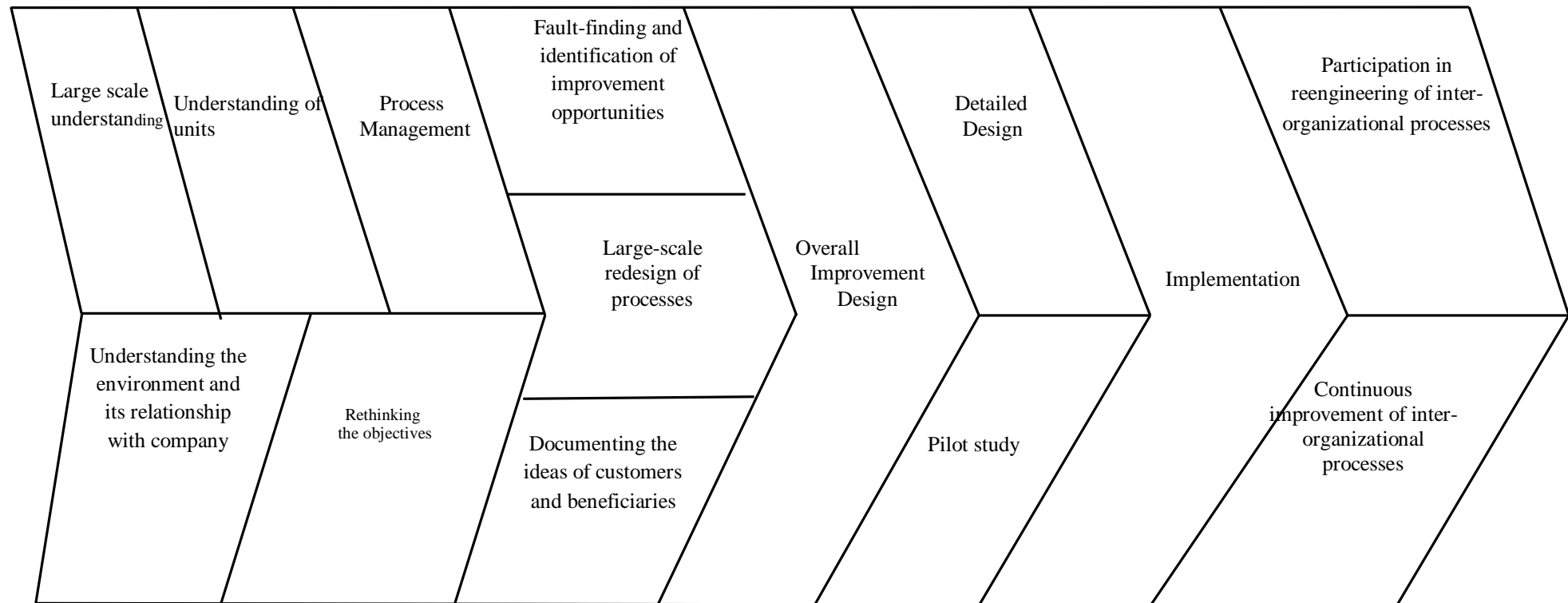


Figure 3 The developed methodology for process reengineering of organizations

## Documenting the Processes of IECK

Iran Small Industries and Industrial Parks Organization (ISIPO) is a development organization which is responsible for policy making, planning, organizing, and supporting the establishment of small industries, towns, and industrial areas in the country in the framework of overall policies of Ministry of Industry and Mine in order to increase the share of industry (especially small industries) in gross domestic product (GDP) using internal and external resources. The strategic objectives of the organization can be delivered as followed:

- Increasing the share of industry in GDP by focusing on development of small industries;
- Developing and completing all necessary infrastructures for establishment of industries in towns and industrial areas and improving business environment for small industries in the country;
- Establishing a dynamic, knowledge oriented, and robust organization which is aligned with global changes.

In line with the industrial development of the province, IECK tries to establish industrial areas and towns; technology, trading, and service centers; and improve industry, especially small industries, by giving facilities and financial, technical, consulting, educational, and service support to applicants and established units in industrial areas and towns and supporting the development of entrepreneurship.

IECK consists of planning and economical, administrative, financial, public relations, preservation, technical, mapping, juridical, and small industries units.

### *Process Identification*

In an interview with different units of the company which was held by reengineering team, the basic processes of IECK were identified as follows:

- Transferring land to applicants;
- The process of identifying the land;
- Positioning process—preparing business plan and arranging the establishment of new estates;
  - The process of granting facilities;
  - The process of establishing salons;
  - Issuing accounting documents;
  - Budgeting;
  - Buying land to develop industrial estates;
  - The method for contractor payments;
  - Petty cash payment;
  - Personnel payment;
  - Selling land and contract-signing;
  - Education process;
  - The process of arranging industrial tours;

- Doing research related to small industries;
- The process of financial reports.

Other important activities in IECK are as follows:

- Performing feasibility studies and preparing industrial-type designs;
- Fault diagnosis;
- Industrial clusters;
- Buying furniture and office supplies;
- Purchasing merchandise (goods entry/exit to/from warehouse).

One of the most important interactions necessary for improving work processes is performing fault diagnosis and process reengineering studies. In line with this, the current condition of work processes should be identified and documented in different sections and units of IECK.

The methods used to identify the problems and faults present in work processes of company's units were direct observation and interview and also studying work processes in the company and in relation with other industrial units. Furthermore, to analyze the problems and evaluate the satisfaction of the holders of industries in IECK a questionnaire was developed and distributed among holders of industries in industrial units and also among the holders of those industries which can potentially be an industrial cluster. It should be noted that the developed questionnaire has been confirmed by related websites and authorities; experts' ideas and evaluations have also corroborated its reliability and validity.

#### *Analysis of the Applied Questionnaire and the Method to Extract Results*

As mentioned before, to identify processes and interventions of IECK about industrial units, beside direct observation and interview with managers and experts in different units of IECK there were also interviews with holders of industries and analysis of the questionnaires which had been filled out by them. In the developed questionnaire, the activity of industrial units, their work areas, operation date of the industrial unit, and dossier completion in the company have been considered. Afterwards, through a precise identification of the activities of Industrial Estates Corporation with regard to its relationship with industrial units, the method of interaction and performing the specified processes and activities was evaluated via 19 multi-option questions. Finally, the level of communication between industrial units and different units and sections of IECK was identified; in this process, the investigated priorities and those units of the Company which had the most interaction with industrial units were mentioned. Moreover, the performance of Company's units and the level of satisfaction of industrial units with their performance were identified and evaluated through some open questions in the questionnaire; the reason for any dissatisfaction was also mentioned. To extract the results from the questionnaire, Likert spectrum was used in the question package in order to change descriptive items into quantitative data and then, in proportion with the obtained results, the level of satisfaction of holders of industries with each work area in the 19 questions was obtained. Subsequently, those processes with which the level of satisfaction of holders of industries was average of

below the average were chosen for reengineering. Also, those units of IECK which have the maximum relationships with industrial units were identified through statistical analysis of open questions of the questionnaire. Moreover, those units with which the holders of industry think the customers are most dissatisfied are determined. By the way, the factors which have caused the most dissatisfaction of holders of industries with the performance of Industrial Estates Corporation are identified and presented. The relationship of industrial units and the type of this relationship with Industrial Estates Corporation will be analyzed below.

### *Investigating the Level of Satisfaction of Holders of Industries with the Performance of Industrial Estates Corporation*

By analyzing the open questions of the questionnaire which have been answered by holders of industries, the processes of technical, financial, juridical, and small industries units have created the most dissatisfaction for holders of industries regarding the performance of Industrial Estates Corporation.

### *The Level of Relationship between Industrial Units and IECK*

By analyzing the open questions of the completed questionnaire it become clear that the maximum relationships of industrial units with IECK has been in the beginning of its establishment; after operation, weak information/notification and lack of appropriate consulting from IECK have practically caused the relationship of industrial units with the Company to be very limited; this relationship is restricted to introducing industrial units to offices, getting loans, access roads, etc. In these aspects, also, there has been many complains and dissatisfactions from holders of industries. In the beginning of industrial units' establishment, the most relationships of these units with Industrial Estates Corporation is with technical, small industries, financial, juridical, planning, and mapping units.

### *The Effective Factors on Dissatisfaction of Industrial Units with IECK Performance*

The most important factors effective on complaints about and dissatisfactions with industrial units have been identified through a detailed analysis of open questions of the questionnaire:

- Infrastructure facilities;
- The amount of land granted to industries;
- Weakness and weak activity of industrial estates' board of trustees;
- Overall policies of Industrial Estates Corporation;
- Working capital loan;
- Inappropriate condition of estate's roads and access road;
- Lack of IECK inspection of industrial units;
- Gratuitous loans;
- Estates' lighting;
- Pursuit of ownership documents of the land;
- Unhealthy competition between units;

- Deficiency of green areas in industrial estates;
- Garbage problem, etc.

A main part of industrial units are dissatisfied with the way the units of Industrial Estates Corporation deal with the problems of industrial units; the majority of them have recognized this lack of tracking to be originated from structural problems in and general rules of Iran Industrial Parks Organization. The most satisfaction in the units of Industrial Estates Corporation has been with the chief executive officer.

### *Identifying Key Processes for Fault Diagnosis and Reengineering*

In identifying the current condition in the Company and in the analysis of satisfaction results of holders of industries expressed in 19 questions of the questionnaire those processes which are not in an adequate or high level are chosen for reengineering. These processes are as follows:

1. Education process;
2. The process of granting facilities;
3. Industrial tours;
4. Contractors payments;
5. Personnel payments;
6. Preparing financial reports;
7. Preparing management reports;
8. Information and notification process;
9. Processes related to juridical unit of the Company;
10. Positioning process—preparing business plan and arranging the establishment of new estates;
11. Administrative process (non-attendance tracking).

### **Reengineering process and Improvement Projects**

In this stage, all the processes of the Company which need fault diagnosis and reviewing are investigated, their current condition are reviewed, the problems and suggestions for each process are specified, and finally some processes have been designed for improving them. This procedure has been studied in detail for education process, granting facilities, industrial tours, financial matters and personnel payments, preparing financial reports, preparing management reports, information and notification process, juridical process, positioning, and preparing business plan; the problems of these process have been identified and the necessary suggestions for their improvement have been presented.

### *General Problems in IECK*

In the majority of Company's units, personnel believed that the division of work was unfair, the workforce for that activity was low, and there was too much common data among the units. But, unfortunately everyone has a database for him/herself which is almost kept traditionally; handwritten forms are very common and preparing periodic and management reports are very time-consuming. In some units, computer, technology,

and management information systems are used as typing systems; those units in which software is used, it is almost used as a database or at most for reporting. In some units, software even has made works more difficult for it has made works manifold by requiring the repetition of data input; there is sometimes resistance against change and lack of flexibility. Many ideal software programs have been designed which cannot be rapidly implemented. IECK website is weak as compared to other websites in the province; the Company delivers information to its applicants weakly and hence they should be present in person for each stage of their work and tracking their tasks.

### **Suggestions**

- Timing and work study to determine expert time of each activity and process;
- Identifying and determining the necessary specialties in the unit;
- Determining the number of necessary manpower and experts in the unit;
- Using common database to prevent repetition of data input, for easy access and clear information;
- Using software programs that can be implemented and applying them in reporting;
- Unifying Company's forms;
- Needs assessment and holding appropriate training courses which satisfy the needs of industrial units;
- Launching a software which enables applicants to connect online and apply or track their application;
- Publishing the information about different cases via website;
- Holding different courses for industrial units in order to clarify the function of company and each one of its units;
- The existence of an online connective agent between industrial units of estates and IECK to identify the common problems and reflect them to industrial estates corporation;
- Developing a dynamic questionnaire for industrial units to identify the problems before and after their establishment;
- Using performance assessment and customer satisfaction assessment models in the units of IECK;
- Determining evaluation indices for industrial units and continuous assessment of units for granting facilities, etc.;
- Providing good counsel for industrial units and trying to resolve their problems;
- Arranging industrial tours and appropriate scientific and executive visits according to the needs of industrial units;
- Existence of further work relation between Company's units to prevent time-waste, duplication of tasks, and applying uniform work policies in all units of the Company;
- Carrying out market studies to identify sale potential of the market, market's share, alternative products and material, etc.;
- Training middle and senior managers;
- Designing financial, commercial, and after-sale services system;
- Feasibility study of development projects;



- Needs assessment of education and applying quality management systems like ISO 9000:2000

## Conclusion

This article investigates the issue of processes' identification and their organizational diagnosis in IECK through BPR methodology. Accordingly, the key processes of IECK and their implementation method in relation to industrial units established in Industrial Estates of the Kurdistan province have been identified and industry holders' satisfaction with their implementation method have been also evaluated. Those processes which have entailed the most dissatisfaction of industry holders have been evaluated via BPR methodology and some improvement methods have been proposed for them.

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