



Effect of Reengineering on the Information and Statistics Process in the Iran University of Medical Sciences

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Abstract

Introduction: Nowadays, organizations working in dynamic and competitive environments have to change their processes from both the inside and outside of the organization. One of the most effective strategies for monitoring and controlling these changes is re-engineering. This study aimed to refine the collection and classification process of data through re-engineering.

Methods: This study was done with an analytical-descriptive approach in 2012, in the Planning and Budget department of the Iran University of Medical Sciences. Data were collected by documents, interviews and observations. Three main process indicators include: number of activities, time, and costs of human resource. These were calculated and compared before and after the implementation of the reengineering. Data were analyzed using Microsoft Excel 2007.

Results: The current status of the process included 53 activities that reduced to 27 after reengineering. Total process time was reduced from 79 to 38 days and direct human costs decreased to about 15 million Rls. Thus, by the implementation of reengineering, the number of activities, time and costs were decreased to 49%, 52% and 54% respectively.

Conclusion: Based on the findings, re-engineering led to improvements of performance and saved resources. Therefore the use of this technique is recommended in order to have an improvement in different performances, increases satisfaction and saves resources.

Keywords: Reengineering, Process, Information, Performance, Data Collection

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1. Introduction

The resource of most managerial decisions and activities in any organization, especially in health care organizations, is access to comprehensive, relevant, classified, and timely information. On the other hand, making use of efficient information systems in order to improve the efficiency, effectiveness, quality of services, and increase the satisfaction in this group of organizations is considered essential [1, 2]. One of the priority activities in the World Health Organization (WHO) is to help achieve precise, accurate, and up-to-date information for the process of evaluating organizational performance and report codification [3]. Most information systems in health care organizations have gradually shaped, instead of having a planned and controlled process. For example, duplicate data collection, unavailability of timely and relevant data, the long processes and existence of unnecessary steps in the processes can be mentioned that will lead to dissatisfaction of patients and personnel. This fact indicates the importance of reviews and modifies the processes as a managerial priority [4].

Nowadays, organizations work in a dynamic and competitive environment having to change their task processes both for internal and external reasons [5]. One of the most effective strategies for conducting and controlling the changes is

the application and implementation of re-engineering [6]. Re-engineering of processes is defined as precise understanding with a process-oriented approach to the organization, accurate depiction of the relationship between activities and process implementation conditions, estimation of resources, costs and the required time to conduct the processes, and then modification and optimization of the relationship between activities and process implementation through application of methods, information technology, and new experiences [7].

The results of reengineering is achieving more speed and lower costs in fulfilling the activities of the organization, providing the key objectives of the organization such as superior position in competition, better customer services and attracting their satisfaction and ultimately add more value to the organization [8]. A study which was conducted by Kordi and Najfi (2009) revealed that the management of processes decreases the costs up to 50 percent and improves the inter-section coordination [9]. A study by Khon-Siavash and Mohammadi (2009) examined the challenges of implementing process reengineering in the Iranian public organizations, concluded that managers will benefit more favorable and better results, if they use modeling strategies instead

of spending time and costs on meeting technological challenges that are created during executive tasks [10]. A study by Tefan Institute shown that the process time decreased by 27 percent due to the implementation of reengineering [11]. A study by Amiri et al. (2010) proves that the enhancement of service quality, increasing employer satisfaction, ability improve production processes, the integration of the organization, efficiency, and reducing the production time are recognized as reengineering effects [12]. In a study on strategic management of reengineering in organizations that was conducted by Kermanshah and Sepehri (2006) focusing on criticizing organizational reengineering theories revealed that reengineering models will be different from each other regarding the life cycle of the organization, the status of human resources, and the status of technology in the organization [13].

One of the methods of process reengineering is making use of task simplification techniques. This technique eliminates the extra activities and replaces them with new methods through creating changes in methods that organizational processes were implemented. In this approach, which is established based on Hummer and Champy, after the formation of reengineering the team whose members are the process owners and stakeholders and after identifying the problematic processes, reengineering will be done by identification and precise recording of the process steps and then modification and improvements will be done [14-16]. Since improving the process of data collection significantly increases the efficiency, effectiveness, and quality of services and customer satisfaction, this study was conducted aiming to assess the effects of reengineering the data collection and classification process.

2. Methods

This is a qualitative study applying action research methodology conducted in a descriptive –analytical method in 2012 at the Department of Planning and Budget of the Iran Universities of Medical Sciences. For the purpose of this study which was conducted to modify processes through re-engineering, the process of data collection was elected among the main process with the opinion of university administrators, on the basis of brainstorming according to time and budget constraints. The sample of the study was the experts and the management of the Department of Statistics and Information as the process's main owners. According to studies done by Sourji (2007), all reengineering models possess common dimensions; thus, in his book entitled *reengineering in Iranian Organizations*, he has provided a localized version whose bases include improvement and modification of task methods. The present study is also based on the steps of this methodology [7]. The data gathering tool was the standard form of the task flowchart which was completed via reviewing the documents, observing the activities, and interviews with process owners [17]. Based on the aims

of the study, three performance indicators were determined: The number of process activities, the required time for completing the process (in terms of day), and the direct cost of human resource (in million rials). In order to calculate the time indicator, the duration of each step of the process (per hour) was declared by the relevant expert, and it was recorded in the form after getting feedback from the information manager and the research team. Then, the total time to perform all stages of the process was determined and then converted to day unit (every 8 hours of work equaled day). Furthermore, for measuring the indicator of human resources costs, first, all of the average monetary value of one hour of activity for each process expert was calculated based on their salaries and it was multiplied by the total number of hours spent for each of them in process. This study was carried out in a few steps: in the first step the process reengineering team consisting of the personnel of Information Department was formed and they were trained by the researchers. In the second step, the ID and scenario of the process was completed based on the standard form. Then in the third step, all the activities of the data collection process, from the beginning to the end, were recorded in the form of vertical flowchart of process. All unrelated activities to the process were excluded from the study. In the fourth step, the reengineering operation (in the format of elimination, integration, maintaining, etc.) was performed by experts as the most important part of the task. Finally, a modified vertical work flow of process was drawn and extra activities were removed, integrated or combined by helping team members. In order to data analysis, Excel 2007 software was used.

3. Results

The findings resulted from studied variables (number of task steps, time and cost of the process) in data collection process before and after the reengineering shows that all parameters have significantly improved. The data collection process of the university was done in five main sections whose activities was divided and recorded in six processes including: Decision making, Recording, Pause/Delay, Inspection, Transmission and Operation.

As illustrated in table 1, before reengineering, the data collection process was conducted in 53 activities; however, after the modification of the processes it was reduced to 27 activities. In other words, by the implementation of reengineering 51% of the activities were either eliminated or integrated. Use of information technology in the reform process includes replacing the virtual archive, using electronic signatures in multiple correspondences and administrative communications, using computerized systems played an important role. The highest decrease in activities was related to the process of operation and transmission. And the lowest decrease in activities was related to the process of recording (Figure 1).

Table 1. Comparison of the number of data collection activities before and after reengineering based on the type of activity and the functor.

Row	Type of activity	Functor	Decision Making		Recording		Delay		Inspection		Transmission		Operation		Total		
			Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	
			1	Statistics and Information Experts			1	1	2	1			4	2	11	6	
2	Statistics and Information Manager	1								4	2	11	6			16	8
3	Deputy Director of Management Sources	2	1							3	1	6	5	1		12	7
4	Office of University President											1					1
	Total			3	1	1	1	2	1	7	3	25	15	15	6	53	27

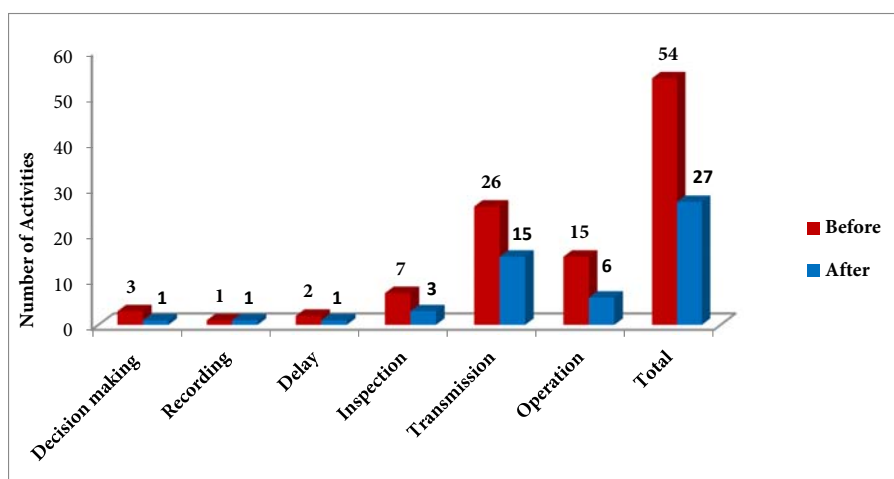


Figure 1. Comparison of the activities for the process of data collection and classification before and after reengineering

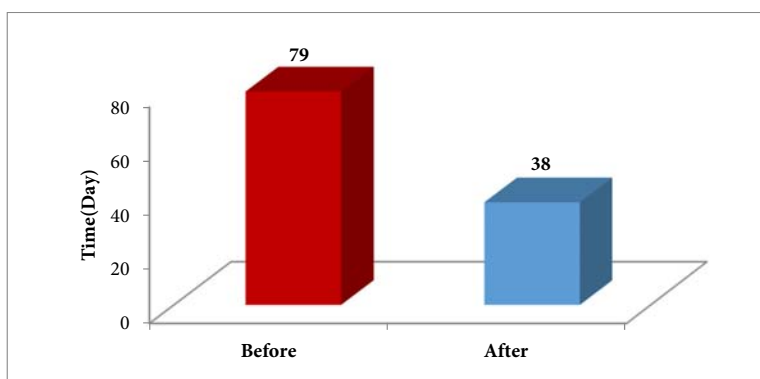


Figure 2. Comparison of "time" indicators for the process of data collection before and after of reengineering (day)

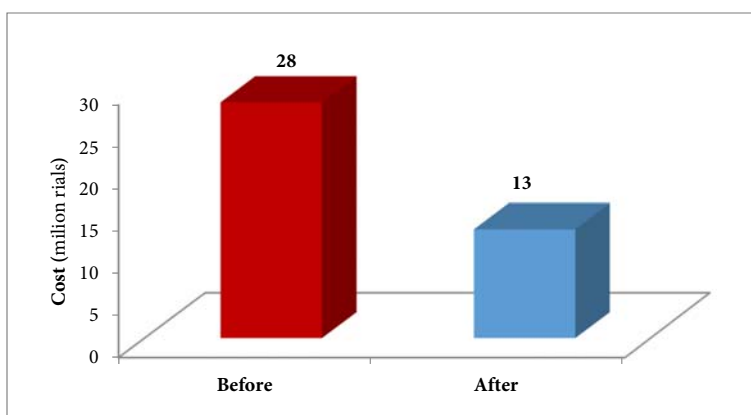


Figure 3. Comparison of "cost" indicators for data collection process before and after reengineering (million rials)

In terms of "time" indicators, the time required for the process of data collection and classification was reduced from 79 days to 38 days after the reengineering (Figure 2).

Also, from the viewpoint of "cost" indicators, human resource costs of data collection and classification process was reduced by 15 million rials after reengineering (Figure 3).

4. Discussion

According to the results of all investigated indicators (number of task steps, time and cost) in the data collection process, before and after reengineering, all of the indicators have significantly improved. Based on the results of the study, significant outcomes were found from the reengineering of the data collection and the classification process and implicating it in the organization based on the performance indicators of time and cost. So after implementing the reengineering and process modification, the data collection and classification activities were reduced to 27. In other words, 49% of the activities were eliminated by the application of reengineering.

In this study, a substantial reduction in the duration of processes was observed which is consistent with what is expected from implementing reengineering principles in the organization. The required time for data collection and classification was reduced from 79 to 38 work days after the reengineering implementation (52%). In the study by Tefen Institute a 27% reduction in the process duration was obtained that was consistent with the results of the present study with 52% reduction in process duration; however, the reduction of the process duration in the recent study is more than that of Tefen study [11]. In a study entitled "Business Processes Reengineering Portfolio Selection" stated that the reduction in the production time is one of the reengineering effects. So the results of our study also indicated the reduction of time and cost due to the application of reengineering [12].

Further, by the implementation of reengineering, the amount of direct human resource costs that were paid in the form of salaries decreased by 15 million rials. The results of the study are consistent with the results of the study conducted by Kordi and Najafi, which was associated with 50 percent decrease in the costs due to the application of reengineering [9]. A study by Sarraf (2010) on implementing an appropriate model for process reengineering, states that reengineering leads to accelerating the activities and reducing the costs [18]. In our study also 54% reduction in costs and 52% reduction in the duration of activities were obviously observed. Thus, regarding the fact that one of the fundamental problems in healthcare organizations is the lack of resources, and also studies have indicated that a lot of resources are wasted in this section, so application of reengineering in healthcare organizations seems to be useful.

In a study conducted by Yahyavi as "Achieving Customer Satisfaction by Re-engineering" shown that reengineering is as a tool for improving satisfaction [19]. Thus it is essential

that the benefits of implementing of reengineering be considered by managers of organizations. In our study, reduction of time, cost and the number of activities, can increase the satisfaction of users who are also our internal customers. The Significant limitation of the present study was unavailability to indirect manpower costs of process.

5. Conclusion

Regarding the fact that process re-engineering is a method that affects all aspects of an organization, it is necessary to have full control over the entire task stages and evaluate the performance of process reengineering by the executors and administrators. Based on the findings of this study, reengineering improves the performance and saves the organizational resources. Hence, regarding the dynamism and competitive environment of today's organizations, and also regarding the entrance of new technologies into administrative and organizational domains, this method is recommended to be used regularly and periodically. According to the importance of re-engineering to increase productivity, updating the process by the other departments of universities will be recommended.

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Authors' Contributions

PM contributed to the implementation, interpretation, writing of manuscript. ND & MM performed the review of the literature, and edited the first version. MY & MA contributed to study conception, design and interpretation. ME contributed to study conception, design, implementation, interpretation and the writing of the manuscript and he is the guarantor responsible for the content of the article.

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