

# The Impact of BPR<sup>1</sup> on Health Care Sector Efficiency

Applying on "medical equipment maintenance department"

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## المخلص

البحث بعنوان " أثر اعادة هندسة العمليات الادارية على كفاءة قطاع الرعاية الصحية بالتطبيق على قسم صيانة المعدات الطبية. وقد أجريت الدراسة لجذب الانتباه إلى أهمية تطبيق مفهوم إعادة هندسة العمليات الإدارية على الرعاية الصحية في المستشفيات المصرية. كما أن الدراسة تشير الي أهمية إعادة هندسة على عمليات الصيانة التي تتصل بنظام تقديم الرعاية الصحية وتأثيرها الملحوظ على الكفاءة التنظيمية في كفاءة المستشفيات، على وجه التحديد، في قسم صيانة المعدات الطبية. ويمثل مجتمع الدراسة جميع العاملين في مجال الرعاية الصحية الذين يعملون في قسم المعدات الطبية في المستشفيات. هذا وقد اعتمدت هذه الدراسة على دراسة (٢١) مستشفى في مصر من أنواع مختلفة. حيث شملت عينة الدراسة (١٥١) مشاركا يعملون في قسم صيانة الاجهزة الطبية بمعدل استجابة (٩٥.٥٦٪) من إجمالي الاستبيانات الموزعة. وأظهرت نتائج الدراسة وجود تأثير كبير لتنفيذ هذا المفهوم الادارى على كفاءة الاداء بالمستشفى عند (ف > ٠.٠٥). بالإضافة ان نتائج الدراسة قد افادت بأن منهج إعادة هندسة العمليات الإدارية يمكن أن تستخدم في دعم قسم المعدات الطبية في المستشفيات للمساعدة في تقديم كفاءة الخدمة الطبية المثلى. بحيث يمكنه أن يقلل من التكلفة والوقت والجهود. واوصت الدراسة بالنظر الى اهمية هذا المفهوم الاخذ به مع توفير الاحتياجات الادارية اللازمة لتنفيذه من تضافر جهود كافة العاملين مع وضوح الخطة العامة للمنظمة ووضع لائحة للحوافز والتشجيعات تدعم تنفيذه .

<sup>1</sup> BPR : Business Process Reengineering

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## Abstract

The study was conducted to bring the attention to the importance of applying the concept of Business Process Reengineering (BPR) to healthcare, specifically , to estimate the effect of the BPR approach on the healthcare sector efficiency in Egyptian hospitals. Also, the study investigates the importance of the Reengineering on the maintenance processes which relevant to healthcare delivery system and their effects on organizational efficiency. Particularly, in the hospitals efficiency, Specifically, in the department of medical equipment maintenance.

The main objective of the present study was to investigate the impact of applying BPR on the Egyptian hospital efficiency in in a specific way in medical equipment. The study population represented all health care professionals working in the medical equipment department in the hospitals.

The study depends on studying ( 21 ) hospitals in Egypt from the different types. The data covers the fields of engineering staff rather than the medical staff from.

Study sample included ( 151 ) participants . The response rate was (95.56 % ) of the total questionnaires distributed. The implementation of BPR concept consists of six stages were : preparation , analysis , redesign , implementation , evaluation & improvements .

Study results showed a significant impact of all BPR concept implementation on the hospital efficiency at ( $p < 0.05$ ).

The study findings state that the approach of Business Process Reengineering can be used in supporting medical equipment department in hospitals for helping in delivering the optimal medical service efficiency. Also, the study findings were represent a great impact of BPR approach on healthcare efficiency that this concept can save cost , time & efforts .

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**Keywords:** Business Process Reengineering, Reengineering, organizational efficiency, Hospital Efficiency, Efficiency, Health Sector, Egyptian Hospitals.

### 1- Introduction:

Business process reengineering is a complicated process of analysis, optimization and reorganization of the business processes with the aim to achieve higher rates of production and as a result profit. Business process

reengineering is a difficult process which requires high experience and knowledge.

This study is about the measuring of the effect of business process reengineering (BPR) on Health care sector Efficiency and it aims to determine its impact on the health care sector performance, specially, in the field of medical equipment maintenance programs.

Business process reengineering can be observed in two phases. First of them is the analysis which helps to understand the image of the ideal business in the chosen area .

The second phase is based on the analysis of the methods which can be used to change the existing form of the business into the ideal one. It is obvious that reengineering should be conducted without enormous expenditures, but the change should be fast and effective.

## 2-Literature Review :

### 2-1 What is reengineering?

“Reengineering is “ *the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance such as cost, quality, service and speed.*”

According to Hammer and Champy<sup>5</sup>, the last but the most important of the four key words is the word-‘process.’ BPR focuses on *processes* and not on *tasks, jobs* or *people*. It endeavors to redesign the strategic and value added processes that transcend organizational boundaries<sup>6</sup>.

### 2-2 What to reengineer?

According to many in the BPR field reengineering should focus on processes and not be limited to thinking about the organizations. After all the organization is only as effective as its processes<sup>7</sup>So, what is a process? “A business process is a series of steps designed to produce a product or a service. It includes all the activities that deliver particular results for a given customer (external or internal).

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<sup>5</sup> Hammer, Champy. 2003

<sup>6</sup> [http://ge.wikipedia.org/wiki/Business\\_Process\\_Reengineering](http://ge.wikipedia.org/wiki/Business_Process_Reengineering)

<sup>7</sup> ibid

So companies that are currently used to talking in terms of departments such as marketing and manufacturing must switch to giving names to the processes that they do such that they express the beginning and end states. These names should imply all the work that gets done between the start and finish<sup>8</sup>.

### 2-3 The Conception & Evolution of BPR:

Since its conception in the 1990s, BPR has been adopted by several firms rapidly and BPR discourses have grown exponentially (Wang 2008).

In response to cases of BPR project failures, researchers began to question and criticize the BPR principles. In particular, it was argued that the principles forgot the human element of a business, and that the clean slate approach was unrealistic (Feller and Bentley 2001; Wang 2008).

This generated the *first* term which three BPR-related conceptualizations: business process change (BPC) (Guha et al. 1997; Kettinger, Teng and Guha 1997; Grover and Kettinger 2000), business process transformation (BPT) (Grover and Markus 2008; Zwass 2008), business process management (BPM) (Alsaigh 2010; Hammer 2010; Rosemann and Brocke 2010).

## 3- Methodology :

**3-1 Study problem:** The problem of the study defined as: there is a gap between the aimed performances efficiency from the medical devices maintenance department in healthcare organizations and the actual status of its performance.

**3-2 Study Approach:** the research approach followed in conducting the study can be positioned within the descriptive analytical approach .

The researcher will collect data and information about the phenomenon under study as it is from its sources, thus, it will be analyzed and explained with the usage of questionnaire as a tool for study.

**3-3 Study hypothesis:** There are statistically significant differences between applying the BPR approach and The Efficiency in healthcare sector.

This Divided to three sub-hypothesis

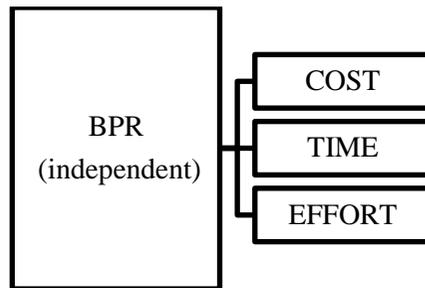
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<sup>8</sup> <https://www.scribd.com/document/6702172/BPR-Methodology>

- There are statistically significant differences between applying the BPR approach and **the cost** in healthcare sector.
- There are statistically significant differences between applying the BPR approach and **the time** in healthcare sector.
- There are statistically significant differences between applying the BPR approach and **the effort** in healthcare sector.

#### 3-4 Study model

Then, according to the previous hypothesis ,the research model have been derived as follow :



(Fig 1) – ( BPR – EFFICIENCY ) relationship model - Edited by the researcher

**3-5 Study field:** The study will be applied in the healthcare sector only specially, in case of the most common types of Hospitals in great Cairo.

**3-6 Study society:** The study field contents of staff of managers & employees and engineers whose works in contact with medical devices maintenance and preparation in Cairo hospitals.

**3-7 Study population:** the study population was addressed to the sector of *Medical Equipment Department members* :

Such as : staff of medical equipment managers, employees, engineers & technician who work in contact with medical devices maintenance and preparations in the hospitals which belongs to the Ministry of health , University hospitals & private in Great Cairo governorate .

**3-8 Study tools:** the questionnaires were used as study tools which designed scientifically to adapt this study. Design of structured questionnaire was

done, the target group involved the Medical equipment team for each hospital in the study site (greater Cairo cosmopolitan provinces) .

So , *the questionnaire* was designed to survey this point with the maintenance team in hospitals who in charge to keep medical equipment working efficiently and if the normal working cycle help them for achieving this efficient performance for medical equipment or need to reengineer the working routines to achieve more best.

**9-9 Study hospital Sample:** Study sample was non randomized purposeful sample , because it was a non- randomized one .The research sample is (21) hospitals which represented the different types of hospitals (the governmental , university & private hospitals ) which be located in the study field in the Great Cairo.

**10 The study site:** The research sample is (21) hospitals which represented the three types of hospitals (the governmental , university & private hospitals ) which be located in the study field in the Great Cairo .

organization	serial	Belongs to	Name
Hospitals of Ministry of health	1.	General	Alharam
	2.	Specialized inst.	Inst . of Naser
	3.	Specialized inst.	Inst. of heart
	4.	Educational	Almatarya
	5.	Educational	Alsahel
	6.	Curative	Gomhourya
	7.	Health insurance	Sednawi
University Hospitals	8.	C.U.	Kasr el einy (french)
	9.	C.U.	Kasr el einy (manial )
	10.	A.S.	Ain shams
	11.	A.S.	Demerdash
	12.	MOH- HELWAN	Sheikh zaid
	13.	HELWAN	Badr
	14.	ALAZHAR	Alhussein
Private Hospitals	15.	Private	Dar Alfouad
	16.	Private	Saudi -German
	17.	Private	Alsalam
	18.	Private	Dar-assalam
	19.	Private	Misr international
	20.	Private	Dar alhikma
	21.	Private	Alshrouk

Table (1): the research site

Source: prepared by the researcher.

Seven hospitals were chosen from each sector of the different types of hospitals, In order to represent the case study clearly , because seven hospitals was the sufficient number of hospitals which belongs to one of the representative hospitals from each sector to assure equal representation of each sector in the chosen sample .

**٣-11 Inclusion criteria :**

The following participant are included in the study :

•*Medical equipment team* : selected from each hospital in study site (greater Cairo cosmopolitan provinces) which working in the medical equipment department who in charge of maintenance and keep quality of medical devices, Such as : Medical equipment department managers, Biomedical engineers, Technicians, Technician assistant and Artisan & administrator employees .

**٣-12 Research Sample Size :**The sample size according to their locations was explained in details in the next table (2) :

The sector	Total
Hospitals of Ministry of health	93
University Hospitals	35
Private Hospitals	30
Total	158

Table (2) the sample size .

Source : prepared by the researcher .

*Actual sample size* : As mentioned in table (2) the actual size of the selected sample according to the returned data tool was reached a percentage of (95.56%) from the total selected participants to share in the data tool which was 151 participants as declared in table (3)

No of questionnaire 1	Returned back
158	151
Total actual sample ( 151) questionnaire :	
Percentage of accepted : (95.56%)	

Table (3) Actual sample size according to the returned data tool

Source : prepared by the researcher .

#### ٤- Testing tool consistency :

For the purpose for testing the consistency of the questionnaire in order to determine to what extent the researcher can rely on it in testing the research hypothesis and achieving the research objectives , The validity was tested through calculating Cronbach's Alpha coefficient which the method for measuring the internal consistency for summated scale measurements such as Likert scale .

Alpha interpreted as a confidence acceptable value for the Alpha coefficient (especially in social science) are 0.6 and above ( George and Mallery,2003).

Two dimensions questionnaire was evaluated for reliability and internal consistency . The reliability determined by Cronbach's Alpha coefficient of (0.7), the initial reading gave an average of (0.7683), then after making the modifications as suggested by the experts, the Cronbach's Alpha coefficient was reached to (0.8845), which was better than the initial conditions.

#### ٥- The general characteristics of participants :

The percentage of 54.3% of participants were males ,and 45.7% of females as shown in table (4), it is meaning that the most technician in maintenance field was male . and females mostly working in following and mentoring and paper-working in the engineering department .

		Gender		
		Frequency	Valid Percent	Cumulative Percent
Valid	MALE	82	54.3	54.3
	FEMALE	69	45.7	100.0
	Total	151	100.0	
Total		151		

Table(4) The sample gender

On the other hand , A percentage of 52.3% of participants were recently hired and their experience less than 5 years and they present the major ratio in the sample ,and 42.4% of medium experience such as 6 years to 10 years that represent a moderate experience , But the experts who has an experience more than 20 years represent only a percentage of 2% from the technical sample .Otherwise the staff who has an experience from 11 years to 20 years were represent 3.3.% from the total sample .

this data mentioned statistically in table (5).

		Experience		
		Frequency	Valid Percent	Cumulative Percent
Valid	1:5	79	52.3	52.3
	6;10	64	42.4	94.7
	11:20	5	3.3	98.0
	21;35	3	2.0	100.0
	Total	151	100.0	
Total		151		

Table (5) The sample experience levels

Moreover, A percentage of 73.5% of participants were technician , assistant technician and artisan from the total sample . while , the mangers were the least percentage of the sample that presented in 2.6% only from the total sample . in case of engineers they were represent less than 18% from the sample , the previously mentioned data according to table (6).

		Title		
		Frequency	Valid Percent	Cumulative Percent
Valid	tech	111	73.5	73.5
	eng	27	17.9	91.4
	dept.head	9	6.0	97.4
	manager	4	2.6	100.0
	Total	151	100.0	
Total		151		

Table (6) The sample titles

While, Expert participants were take share in the questionnaire as percentage of only 1.3% , the percentage of 56.3% of participants were more younger who represented in 37.1 % from the total sample .

## ٦- The study analysis:

The medical devices maintenance department in Egyptian hospitals actually suffers from many problems such as: mass paperwork, faint controlling for device usage moreover the shortage in spare parts and the delaying in external maintenance , the centralization for making the decision, roles overlap and the relatively absence of IT usage in self-diagnosis.

So, these problems which the department suffers from could result a waste in time , efforts moreover the cost .

So, the results of the respondent answers about the efficiency which can be affected by implementing the approach steps of Reengineering to test the impact of BPR on their work efficiency, The questions went in three sections, which the efficiency can effect on, the cost, time and the efforts. So, the study will examine the effect of BPR approach on these variables as : ( cost . time & effort ) .

### ٦-1 Studying the variable (Cost):

The first variable for testing is "the cost", the respondents answered a five questions about this variable , in first place, "the combination for some process "had come by a value of mean equal to 4.653 , followed by the " the financial & technical committee for monitoring the arguments, contacts , and supplying orders" which reached a mean of 3.975 , lastly the " paperwork types " had come by a value of mean equal to 2.361.

Table (7) summarized the mean of each variable in each question.

		Process combination	Paperwork	Good controlling	Fin.&tech. committee	Maintenance shortage
N	Valid	151	151	151	151	151
	Missing	0	0	0	0	0
Mean		4.6538	2.3611	3.0993	3.9751	3.4371

Table ( 7 ) : the cost

### 6.2 Studying the variable (Time):

The time as a second variable for testing , the respondents were asked to answer another five questions about this variable , the disagreement was appeared in the first question which asked about " the department present a quick solution for the technical problems more over the administrative problems " , because the mean value was declined under 3 . notably , the other questions were over 3 which give a meaning of agreement such as the questions about " centralization in decision making , a large paper cycle , the routinely work and a repeated arguments " , with values of 3.27 , 3.41 , 3.74 ,3.75 respectively , which represented the actually case of working which let them have a great desire for reengineering ; aiming for improvement and development . Table (8) summarized the mean of each variable in each question.

		Quick solving	Repeated argument	Routinely work	Large paperwork cycle	Centralization
N	Valid	151	151	151	151	151
	Missing	0	0	0	0	0
Mean		2.3658	3.2753	3.4161	3.7431	3.7591

Table ( 8) : the Time

### 6-3 Studying the variable (Efforts):

Furthermore, the third variable which the data tool asked about was " the efforts". The five results value expressed statistically in table (9) as shown below about this variable expressing a majority agreement of the question about "the importance of IT "This is attributable to the desire of the respondents to have a benefits of technology for saving efforts according to the well-known principal of Reengineering that confirms the usage of IT for obtaining a dramatic change in work cycle. As well the respondents ensured their need for reconstructing the work cycle purposefully to save efforts expressed that by a value of mean equal to (3.36 ). Otherwise, they presented a disagreement by a mean value of (2.65 )for question one about " a coexistence of best arrangement in work cycle " , that due to the importance of Reengineering to be implemented in this sector .

		Best arrangement	Repeated data	Roles overlapping	Importance of IT	Reconstructing need
N	Valid	151	151	151	151	151
	Missing	0	0	0	0	0
Mean		2.6538	3.3741	3.8893	4.5751	3.3611

Table ( 9) : the Efforts

Finally , as shown in table (10) , there is a general question in the questionnaire as a data tool for testing a desire of the participants about Implementing the Reengineering Approach in their field , Significantly , they showed up a large intention towards this implementing describing this intension by a great value of answering the question by ( full agreement & agreement ) with a mean value of (4. 8818) , according to Likert model which the data tool was designed .

		The approach of Reengineering could affect the performance efficiency
N	Valid	151
	Missing	0

Mean	4.8818
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Table ( 10) : The effect of Reengineering on The Performance Efficiency

## 7- Testing the hypothesis:

The hypothesis had states that :

" **There are statistically significant differences between applying the BPR approach and The Efficiency in healthcare sector**" .

Secondary hypothesis	Spearman's correlation coefficient	Sig. value ( p-value)
cost	0.768	.000
time	0.686	.000
effort	0.825	.000
N of Valid Cases 151		

( $\alpha= 0.01$ )

Table (11): Spearman's correlation coefficient for sub-hypothesis for main hypothesis

This hypothesis was divided to three sub – hypothesis as the following :

### 7-1 The Findings of first secondary hypothesis:

(There are statistically significant differences between applying the BPR approach and **the cost** in healthcare sector. )

According to the first sub hypothesis, It's notable in table (11) that the relation coefficient between BPR and the efficiency variable ( the cost ) ; in healthcare sector was equal to 0.768 at (p-value = 0.000 , lower than 0.01) , which indicating that there are a significant statistical relationship between BPR and the cost of healthcare service providing; at ( $\alpha= 0.01$ ) , this is due to the effective principals of the BPR approach which could affect the cost by reducing the huge number of non-important process and concentrating for a big goal that the principals that BPR approach based upon , such as : process combination , reduction of paperwork & minimizing the steps for doing any process by usage of IT.

### 7-2 The of the secondary hypothesis:

(There are statistically significant differences between applying the BPR approach and **the time** in healthcare sector.

According to the second sub hypothesis, It's notable that the relation coefficient between BPR and the efficiency variable ( the time ) ; in healthcare sector was equal to 0.686 at (p-value = 0.000 , lower than 0.01) , which indicating that there are a significant statistical relationship between BPR and the time of healthcare service providing; at ( $\alpha= 0.01$ ) , this is due to the effective principals of the BPR approach which could affect the time by decreasing the non -beneficial operations, the huge number of non-important process and concentrating for a big goal that the principals that BPR approach based upon , such as : quick solving , clear roles , get rid of routinely works & empowerment which let the decision making faster .

### 7-3 The Findings of the secondary hypothesis:

(There are statistically significant differences between applying the BPR approach and **the effort** in healthcare sector.

According to the third sub hypothesis, It's notable that the relation coefficient between BPR and the efficiency variable ( the effort ) ; in healthcare sector was equal to 0.825 at (p-value = 0.000 , lower than 0.01) , which indicating that there are a significant statistical relationship between BPR and the making of efforts of healthcare service providing; at ( $\alpha= 0.01$ ) , this is due to the effective principals of the BPR approach which could affect the efforts by decreasing the huge number of non-important process and concentrating for a big goal distancing from making a waste efforts that the principals that BPR approach based upon , such as : process new redesign , dependency on IT system , building a team work spirit & minimizing the not required steps .

*In concluding, according to this context and the results before, the second main hypothesis was accepted.*

In concluding, The data of study results revealed that there was a statically significant impact of implementing the reengineering approach and its

principals on the healthcare efficiency which expressed by cost . time and efforts , specially , at the medical equipment maintenance department Moreover , these findings could be expressed as adapted with several previous studies which reported in literature and the most of BPR literature which considered the BPR as a management approach which can lead to long term success , quick improvement and radical change through the participation of all members and the support of top management ( hammer,chamby, 2003).

Lastly . BPR is an approach to continuously raising for the efficiency of performance for all organizations, processes & services.

So, several studies have investigated the impact of BPR principals on organizational performance, many studies have found a strong and positive relationship between BPR concept and time reduction , cost minimizing and effort decreasing.

In general, there was an agreement that a successful implementation of BPR is leading to a quick and radical change .

So , BPR can improve organization according to raising its efficiency as concluded in many previous studies such as ( Agha, 2006),(Khong, 2003) and ( Ahmed ,2007)

Prior studies indicated the approach of BPR leads to improve the performance , increase the productivity , decrease time losses , lowering the wasted efforts , cut down the extra cost , reduce the redundant expenses and also, affect the patient satisfaction , increase profitability and finally raise the healthcare organizational performance ( Hagos, 2011) , (Kassahun\*,2012) .

## **8- Findings & discussion of the study variables :**

### **8-1 The characteristics for the efficiency variable (the cost)**

In five questions asking about the sub-variable ( the time ) of the dependent variable which be ( the Efficiency ) included in the organizational characteristics for the BPR impact on the organization , the lowest value (2.31) was for the item (quick solution) and the highest mean was (3.75) for the item (centralization) , which express a highly ratio

of centralization in daily works which can handicap the work series and delay the decision , thus , the process can take more time for achieving the hospital goals that the department seeking for.

These findings clearly showed that participants (agreed) by an average value of mean equals to 3.26 about the recent variables which can the time be reduced by implementing BPR approach according to the its principals. This findings agreed with studies for (Nattapan,2010) and also they confirmed the view of (Migahid , 2011).

### **8-2 The characteristics for the efficiency variable (the time)**

In five questions asking about the sub-variable (Time) of the department variable which be ( the Efficiency ) included in the organizational characteristics for the BPR impact on the organization , the lowest value (2.3) was for the item (quick solving) and the highest mean was (3,75) for the item (centralization ) , which express a highly centralized management for making decision, which can increase the expended time and delaying the achieving for targets that the department goes through , Otherwise, the minimum value of mean interprets the delay solving for the problems that is raising the time .

These findings clearly showed that participants (agreed) by an average value of mean equals to 3.26 about the recent variables which can the time be reduced by implementing BPR approach .

The study findings agreed with some previous studies as reported in literature such as ( Kassaba,2004), (Agha, 2006) & (khong , 2003).

### **8-3 The characteristics for the efficiency variable (the efforts)**

In five questions asking about the sub-variable ( the efforts ) of the dependent variable which be (Efficiency) included in the organizational characteristics for the BPR impact on the organization , the lowest value (2.6) was for the item (arrangement) and the highest mean was (4.56) for the item (importance of IT ) , which express a highly realization for the potentiality of this variable which can lead the department forward , moreover saving many efforts and reducing a lot of waste efforts. Otherwise, the minimum value of mean interprets the arrangement of the

processes need to redesign seeking for reduce the wasted efforts and saving the work better without extra efforts.

These findings clearly showed that participants (agreed) by an average value of mean equals to 3.59 about the recent variables which can the efforts be decreased by implementing BPR approach .

The findings also identified that the arrangement of the processes should be developed and improved by redesign them using the approach of BPR foe saving the efforts and preventing others from waste efforts.

These findings agreed researchers as (Migahid,2011),(Agha, 2006),(Nattapan ,2010 ) and also the view of (Kassaba, 2004).

### 9 - Measuring the impact of BPR :

According to the previous statically description , the responders had expressed that the BPR approach has a great effect on the efficiency , that the reengineering affected on diagnosis rate by using the IT systems, the waiting time for maintenance had reduced by downsizing the routinely paperwork , the device life age had enlarged in order to fit care by the technicians moreover the safety ratio had increased by doing the calibration in time and the rebuilding of work cycle makes the overall performance much better .

Thus, this BPR approach has a lot of principals can support and reinforce the managerial , technical & financial management in the hospitals .

So, According to the previous notations the study assured that the potentiality of BPR on the efficiency is great.

Then, for measuring this impact; the difference between the efficiency before applying the approach of BPR by making the redesign and after should be calculated such as the next suggested equation ;

<b>Differences between cases (Before &amp; After )</b>	<b>The impact =</b>
Percentage of cost difference	$\{ \Delta (\text{cost}) \ \& \ \Delta(\text{time}) \ \& \ \Delta(\text{effort}) \} =$
Percentage of time difference	$= \{ ( C_b - C_a / C_b ) * 100 / \% \}$
Percentage of effort difference	$+ \{ (T_b - T_a / T_b ) * 100 / \% \}$
	$+ \{ (E_a - E_b / E_b ) * 100 / \% \}$

Table (12) : measuring the impact model

**Where ; C= cost , T= time , E= effort , a = after ( redesign implementing ) ,b = before ( redesign implementing ) , % = percentage value**

## **10- Recommendations:**

Based on the previous mentioned findings of the study, these recommendations could be derived as follow:

- The medicinal services division best administration ought to know by the significance of the approach of business process reengineering and advancing this system for enhancing the human services giving administrations.
- Hospital pioneers need to track their budgetary exchanges to deliver the auditable proclamations on an auspicious premise inside the clinics, to get to, and consider the impact of Business Process Re-designing and its directing variables: coordination and many-sided quality of the framework on the fruitful execution of BPR. Other than they ought not overlook combination with medicinal gear suppliers and outer support supplier.
- It regards take a gander at markers of libertarian initiative in the association. They can encourage things for better representative execution. Then again, their presence alone will never guarantee the craved level of worker execution. Representatives are dependable and preparing need evaluation. This is a preset to complete occupations and meet reasonable execution norms. Also, workers ought to be enabled. This enhances employees' mental quality and settles on them certain while settling on choices and playing out their obligations with a specific end goal to keep their work proficiently and keep the work objectives accomplished up.
- Many researchers portrayed BPR and related data innovation issues as normal accomplices. The medicinal services associations; particularly, the Egyptian doctor's facility need to put in new data framework gear and redesign the current IT related adornments.
- What's more, the association need to utilize a present day and a productive correspondence channel that could ensure for the

compelling and the effective exchange of data to separate workforces of the association.

- The utilization of exceptional instruments of correspondence stations that like email, e-voice, phone and related items may contribute tremendously for a superior workforce execution. The BPR ventures must be intended to set up data and correspondence innovation and simple work and simple get in touch with each other. in this way , it ought to be finished and start its obligation in time, and for rearrangements the upkeep strategy which now should be possible cordlessly abroad.
- Finally, medical equipment maintenance team should work too much on the attitude of employees that may change intentions of resisting change related issues of the organization. In the absence of attitudinal change, it is very difficult to determine the expected level of employee performance. Modifying the related awareness training and conference are useful to change the pessimistic points of views of the labor staff against the change. Otherwise, the workforce intentions to resist changes will be aggravated.

## 11- Conclusion :

Accordingly . BPR is an approach to continuously raising for the efficiency of performance for all organizations, processes & services several studies have investigated the impact of BPR principals on organizational performance , many studies have found a strong and positive relationship between BPR with performance ,there is a general agreement that a successful implementation of BPR is leading to a quick and radical change .

So , BPR can improve organization according to raising its efficiency by reducing time , saving efforts and decreasing cost , as concluded in many previous studies such as ( Ozdemiri ,2010),(Kassahun.2012) .

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