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The Impact of Business Process Reengineering (BPR) on the Reduction of the Production Costs in the Jordanian Public Shareholding Companies listed on the ASE

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Abstract :

The current study aimed to figure out the impact of the Business Process Reengineering (BPR) on the reduction of the production costs in the Jordanian public industrial shareholding companies; the study has adopted the descriptive applied approach. The study population consisted of all the public industrial shareholding companies listed on the ASE which amounted to 73 until the end of 2018. A random, stratified and representative sample consisting of 44 industrial companies was chosen that was distributed across all the industrial sectors. Data required to achieve the objectives of the study was collected through preparing and distributing questionnaires to the managers and employees in the industrial companies at different administrative levels.

The study showed that the level of the scale of the BPR in the industrial companies was medium and the scale of the level of the reduction of the production costs was medium. The study further revealed a significant impact for the dimensions of the BPR on the reduction of the production costs where the dimensions (organizational structures engineering and the HR engineering) had the most prominent impact on the reduction of the production costs. The study most important recommendations include the need to move away from the routine in the job, following modern administrative methods to coordinate the job between units and departments in the company, expanding the circle of powers exercised by the middle and lower departments and providing a suitable and safe working environment for employees for increasing the productivity and the efficiency of processes to reach the optimum level of using the available resources and reducing the production and operational costs.

Keywords: *Business Process re-engineering; production costs; Jordanian industrial companies.;*

Jel Classification Codes : *M41; M49.*

الملخص

هدفت الدراسة الحالية إلى بيان اثر إعادة هندسة العمليات الإدارية على خفض تكاليف الإنتاج في الشركات الصناعية الأردنية المساهمة العامة وقد اتبعت الدراسة المنهج الوصفي التطبيقي. وتكون مجتمع الدراسة من جميع الشركات الصناعية المساهمة العامة والمدرجة في سوق عمان المالي حتى نهاية عام 2018 التي بلغ عددها 73 شركة, وقد تم اختيار عينة طبقية عشوائية ممثلة، مكونة من 44 شركة صناعية موزعة على جميع القطاعات الصناعية, وقد تم جمع البيانات اللازمة لتحقيق أهداف الدراسة من خلال تصميم استبانة تم توزيعها على المدراء والعاملين في الشركات الصناعية وفي المستويات الإدارية المختلفة.

وقد أظهرت الدراسة أن مستوى مقياس إعادة هندسة العمليات الإدارية في الشركات الصناعية متوسط كما كان مقياس مستوى تخفيض تكاليف الإنتاج بشكل متوسط وكشفت الدراسة عن وجود اثر معنوي لأبعاد إعادة هندسة العمليات الإدارية مجتمعة على خفض تكاليف الإنتاج وقد كان لبعدي (هندسة الهياكل التنظيمية وهندسة الموارد البشرية) الأثر الأبرز على خفض تكاليف الإنتاج ومن أهم ما أوصت به الدراسة ضرورة الابتعاد عن الروتين في العمل واتباع الطرق الوسائل الإدارية الحديثة لتنسيق الأعمال بين الوحدات والأقسام بين الشركة وتوسيع دائرة الصلاحيات التي تمارسها الإدارات الوسطى والدنيا وتوفير بيئة عمل مناسبة وآمنة للعاملين وذالك بهدف زيادة الإنتاجية وكفاءة العمليات للوصول إلى المستوى الأمثل لاستخدام الموارد المتاحة وخفض التكاليف الإنتاجية والتشغيلية.

الكلمات المفتاح: *إعادة هندسة العمليات، تكاليف الإنتاج، الشركات الصناعية الأردنية.*

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1. Introduction.

Currently, the business organizations are described by dynamicity, speed of change and the increased organizational levels. This requires companies to adapt to the changes occurring so that they would grow in the long term and maintain their competitive positions.

However, the strong competition and development in the business world with the great changes in the ICT made it hard for companies to survive. Thus, looking for new and developed concepts became necessary for having cooperation with the sophisticated management concepts and maintaining the survival and continuity of those companies. Hence a new trend emerged from James Champi and Michael Hamer towards an introduction for the BPR, which is considered one of the best management methods in the contemporary administrative thought and the best and necessary organizational management models to achieve a competitive advantage. Its importance lies in working on reconsidering all the processes and functions of the organization, studying, distributing and reconstructing it radically. Thus, it adopts a main rethinking in the processes, organizational structure, IT, and the job content to achieve significant improvements in productivity.

2-Study Problem and Elements:

There is no doubt that the cost management in the modern business environment has become a crucial factor for the success of any industrial enterprise for reducing the production costs. This will help them survive and thus maintain their competitive status. However, maybe now the reduction of costs is not enough and that the reduction of costs must be managed from a strategic part where the departments must adopt strategies enabling them to face the internal and external threats for the aim of preserving the competitive position.

However, recently, the so-called "business process reengineering-BPR" has emerged. It might help in the reduction of the production costs. Perhaps, many industrial companies may not grant the BPR its appropriate importance for the reduction of the production costs. Therefore, the study aimed to attempt to explain the impact of the BPR on the reduction of the production costs in the industrial sector through asking the following question:

Is there an impact for the BPR on the reduction of the production costs?

This question is divided into the following sub-questions:

First: is there an impact for the trend towards decentralization on the reduction of the production costs?

Second: is there an impact for the organizational structures reengineering on the reduction of the production costs?

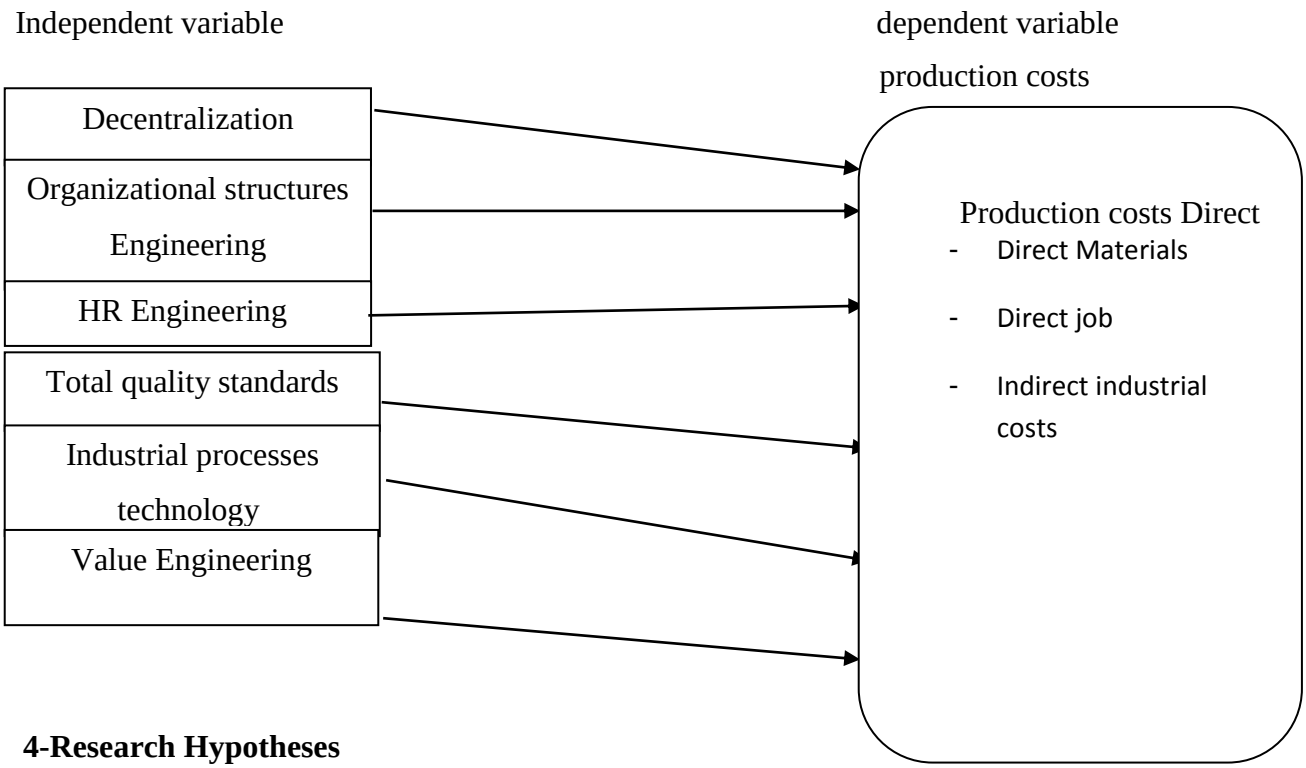
Third: is there an impact for the HR reengineering on the reduction of the production costs?

Fourth: is there an impact for the industrial processes technology (IPT) on the reduction of the production costs?

Fifth: is there an impact for improving the total quality standards on the reduction of the production costs?

Sixth: is there an impact for the value engineering on the reduction of the production costs?

3-Study model:



4-Research Hypotheses

The main hypothesis

H1: There is no impact for the process reengineering on the reduction of the production costs.

It has the following sub-hypotheses:

- There is no impact for the trend towards decentralization on the reduction of the production costs.
- There is no impact for the organizational structures reengineering on the reduction of the production costs.
- There is no impact for the HR reengineering on the reduction of the production costs.
- There is no impact for the IPT on the reduction of the production costs.
- There is no impact for the improvement of the Total quality standards on the reduction of the production costs.
- There is no impact for the value engineering on the reduction of the production costs.

5- Previous studies

- (Azhar, Naz, Gul & Nawaz, 2013) aimed at comparing the use of the principles of the BPR and the principles of the total quality management in improving the product quality in a number of industrial enterprises and companies in Turkey. The study adopted the descriptive method where the researchers examine the studies published in English on the use of the BPR in the companies and the studies on the use of the total quality management principles and their impact on improving the quality of the industrial products. The results of the study showed that there are differences in the impact of using the principles of the total quality and the use of the principles of the BPR in influencing several organizational variables, most important of which is profitability, saving the volume of employment, increasing the level of productivity, and improving the quality of the product in favor of using the principles of the BPR. (Azhar, 2013)

- (Khadiri & Fazziki, 2012) in Morocco aimed at determining the most important factors that help in the reengineering application in the public and private institutions and determining the impact of the application of reengineering within the company on the improvement of the quality of the product and services and the increase in the efficiency of the company's performance. The study sample consisted of the Moroccan company CRI, which is one of the private companies registered

in the financial market. The study concluded that the use of the reengineering principles in the company improves the systems used and that the current and previous systems in the company do not facilitate the application of the reengineering principles. The results also showed that the use of reengineering improves the effectiveness of the company's financial performance although it negatively affects the reduction of the level of the employment in the company (Khadiri, 2012).

- (Khan, 2012) was conducted in Algeria, where the study aimed to determine the use of the BPR as a means of improving the performance of the company's human resources departments. The study adopted the descriptive method through referring to a number of previous published studies to identify the nature of the relationship between the BPR as an introduction for the improvement of the quality of the job and quality and linking it with the improvement of the performance of the human resources departments. The results showed that using the process reengineering means working on changing the processes related to staffing and employees' evaluation through using technology in most human resources management functions. The study results showed that working on using the process reengineering improves the performance of companies. (Alabbadi, 2011) aimed to figure out the role of the BPR on the improvement of the levels of the product quality in Babel tires factory in Iraq. The study used a case study then followed the business and production processes in the factory before and after the application of the principles of the process reengineering. The study adopted the financial analysis of the factory's financial data before and after the application of the principles of the processes engineering management. The results of the study showed that the use of the process reengineering with its various technological and physical forms positively affects the level of the factory's productivity and the improvement of the level of the product provided by the factory.

- (Al-Dajani, 2010)prepared a paper entitled "A proposed model for the business process reengineering and computation in the higher education institutions", where the researcher adopted the descriptive analytical approach to describe and explain the reality of the process reengineering in the Islamic University of Gaza. The researcher also used the structural approach through presenting a proposed practical model for the process reengineering in the higher education institutions and building the application models and tools. One of the most important objectives of the study includes shedding light on the different aspects of the BPR method in terms of the concept, the mechanism of application and the advantages it achieves. The researcher has found that there are attempts to document the work proofs and the simplify the processes before implementing the BPR that do not amount to an effective practice. BPR also leads to an increase in the level of the job satisfaction of the university staff at all their levels of management. The researcher recommended the need to spread and enhance the concept of the BPR for all the employees at the Islamic University from the administrators. Furthermore, (Janin, 2009) which was conducted in the State of New Jersey, aimed to determine the growing role of the BPR inside the company from the point of view of the employees and managers. The study sample consisted of (14) managers and (216) employees working in three companies applying the principles of the process reengineering. The study adopted the questionnaire in the data collection process and the study results showed that (63%) of the managers believe that applying the principles of the BPR is essential for the company's continuity in the market and maintaining a high level of competitiveness within the market. The results showed that the staff perspectives were negative towards the application of the principles of the BPR. In the same context, (Al-Qassimi, 2009)in "Activating the tasks of the BPR from the perspective of the ICT: an integrated introduction". The researcher adopted the systematic method of deduction and inference to test its research hypothesis through the use of Arabic and international books, studies and scientific research, based on two axes (process reengineering and ICT). The study aimed to present the concept of business reengineering and its various stages with focusing on the role that ICT plays in enabling the reengineering programs to achieve their objectives and to diagnose some of the obstacles that prevent this contribution. The importance of the research is highlighted by addressing a topic related to the developments of the

times in the light of modern management concepts and experiences and enriching the scientific library with it. The importance of the research is also highlighted by an attempt to adopt the ICT tools on many administrative processes to guide them in the right direction. (Khalil, 200) conducted a research entitled "The role of the processes engineering in supporting the cost reduction decisions in light of the philosophy of the change management." He made an inductive study to the business management references and the processes that discuss the role of the methods of the process reengineering in improving the business efficiency and production, and rationalizing and reducing the costs in the business organizations. The research concluded many results, most important of which are: the possibility of making a real and substantial cost reduction provided that the companies depend on the system of re-engineering the production, marketing and management processes as the core of the re-change. The research also concluded the possibilities of improving the return on the funds invested as a result of the cost reduction according to the reengineering and the re-change process (AL-Dawi, 2008) conducted a study entitled "The impact of the re-engineering process on the development of the banking service in the National Bank of Algeria," The researcher conducted a practical study of the stages of the BPR in the National Bank of Algeria. The study aimed to determine the impact of the BPR on the development of the banking service as well as the various reformations to which the banking sector is exposed in order to attract the foreign investment. The researcher concluded that the reforms undergone by the Algerian banks through re-engineering their processes according to the MEDA program, which will be circulated to all the banks during the current year, is a refocus of all the human, financial and technological resources around the consumer through a radical redesign of various processes in a way that ensures the speed of the performance of a safe service of a high quality and lower cost. (AlSir, 2008)conducted a study in the Palestinian Authority areas in Gaza which aimed to determine the reality of using the BPR in the Palestinian Ministry of Interior and identify the differences in the reality of using the BPR from the point of view of the employees according to the variables of gender, age, scientific qualification, nature of work, employment partners, job title, number of career courses and number of years of service. The study sample consisted of (300) male and female employees who were randomly selected from the study population. The study sample members responded to the questionnaire and conducted interviews with a number of managers. The study results showed a sufficient awareness among the managers in the Palestinian Ministry of the National Security towards the concepts of the administrative development but they do not have a sufficient awareness about the concepts of the BPR and that there is a duplication and overlap of powers and work between the General Department of Central Administrative Affairs, and the General Administration of the Central Finance with the General Department of the Administrative Affairs, and the General Administration of Finance in the civil sector.

6-Research methodology:

This study is one of the applied researches in solving the field problems and improving the business methods and productivity in the accounting and administrative fields. The study adopts the descriptive method that aims to describe certain phenomena or events, collects facts and information about them, and describes their specific circumstances and determines their status as they are. The study also is interested with determining the phenomena or events that should be covered by the research in light of certain values or criteria. It also suggests the steps or methods that can be followed to bring them to the picture they should be in the light of these standards or values.

- **Population:**

The study population consists of all the industrial companies listed on the Amman Financial Market amounting to 73 until the end of 2018.

- **Sample:**

A sample of 44 companies, comprising 60% of the population size, was selected. It is considered statistically acceptable according to (Sekaran, 2000) tables. The companies were chosen through applying the simple random stratified sample method to ensure that all the industries were represented by the number of the industrial companies in the industrial sector as a whole.

- **Analysis unit:**

The study targeted the general directors, deputy directors, department directors, and departments specialized in financial matters, production, purchase, human resources, information technology, and marketing in addition to the quality center managers, and other department managers such as public relations, training and others. Therefore, the study members represented 60% of the approximately 657 population members. According to (Sekaran, 2000, 22), this sample is representative of the study population. After distributing (396) questionnaires by (9) questionnaires in each company, (388) questionnaires were recovered where (362) were valid for the statistical analysis by (91.4%) of the distributed questionnaires. There were 26 questionnaires invalid for the statistical analysis since they were incomplete.

- **Testing the study tool reliability:**

The Cronbach's Alpha of the Internal Consistency Coefficient was calculated. The results were as follows:

Internal consistency coefficient values for study tool items: Table (1)

number	Dimension	alpha value
1	trend towards decentralization	0.861
2	organizational structures Engineering	0.703
3	HR Engineering	0.847
4	IT engineering	0.695
5	Total quality standards	0.822
6	Value Engineering	0.879
7	Business Process Reengineering	0.819
8	Reduction of production costs	0.874
9	All items	0.896

We note that the values of the Cronbach's Alpha of the Internal Consistency Factor values for the items of the study tool ranged (0.695-0.879). further, the alpha value for all the items was (0.896); thus, all the values were greater than (0.60), which is an indicator of the consistency among the items of the study tool, the reliability of the study tool and the probability of depending on it to be used in the statistical analysis.

- **Study Hypotheses**

Through the questions raised by the study and the objectives it seeks to achieve, the study hypotheses can be formulated as follows:

The first major hypothesis H01: There is no statistically significant impact for the BPR on the reduction of the production costs in the Jordanian industrial public shareholding companies.

The following are the sub-hypotheses of the first main hypothesis:

- The first sub-hypothesis H01-1: There is no statistically significant impact for the trend towards Decentralization on the reduction of the production costs in the Jordanian industrial public shareholding companies.

Sub-hypothesis H01-2: There is no statistically significant impact for the organizational structures reengineering on the reduction of the production costs in the Jordanian industrial public shareholding companies.

- Sub-hypothesis H01-3: There is no statistically significant impact for the HR reengineering on the reduction of the production costs in the Jordanian industrial public shareholding companies.

Sub-hypothesis 4 H01-4: There is no statistically significant impact for the IPT on the reduction of the production costs in the Jordanian industrial public shareholding companies.

Sub-hypothesis 5 H01-5: There is no statistically significant impact for the improvement of the total quality standards on the reduction of the production costs in the Jordanian industrial public shareholding companies.

Sub-hypothesis 6 H01-6: There is no statistically significant impact for the value engineering on the reduction of the production costs in the Jordanian industrial public shareholding companies.

The sub-hypotheses were subjected to the simple regression analysis. The results were as follows:

The first sub-hypothesis H01-1: There is no statistically significant impact for the trend towards Decentralization on the reduction of the production costs in the Jordanian industrial public shareholding companies.

Results of testing the impact of the dimension of (trend towards decentralization) on the reduction of the production costs* Table (2)

Dependent variable	**Model Summery**		**ANOVA**			**Coefficient table**				
	R Coefficient factor	**r^2 coefficient**	**Calculated F**	**D f**	**Sig F***	**Variance**	**β**	**St. error**	**Calculated T**	**Sig t***
Reduction of production costs	0.030	0.001	0.324	1 360 361	0.570	Trend towards decentralization	0.027	0.047	0.569	0.570

* The impact is statistically significant at sig. ($\alpha \leq 0.05$)

The results of table (2) indicate that (r = 0.030), which means that there is a weak relationship between the dimension of the (trend towards decentralization) and (the reduction of the production costs). The value of the selection coefficient was (r2 = 0.001), which means that the dimension (trend towards decentralization) explained (0.10%) of the variance in the (reduction of the

production costs), with other factors remaining constant. Furthermore, the value of (F) was (0.324) at sig. (Sig = 0.570), which confirms the insignificance of the regression at (α ≤0.05).

The table also shows that the value β was 0.027 and the value of t was 0.569 at sig. (Sig = 0.570), which confirms the insignificance of the coefficient at (α ≤0.05).

Based on the above, we accept the first sub-hypothesis stating:

"There is no statistically significant impact for the trend towards Decentralization on the reduction of the production costs in the Jordanian industrial companies.

Sub-hypothesis H01-2: There is no statistically significant impact for the organizational structures engineering on the reduction of the production costs in the Jordanian public industrial companies.

Results of testing the impact of the dimension of (organizational structures Engineering) on the reduction of the production costs* Table (3)

Dependent variable	Model Summery		ANOVA			Coefficient table				
	R Coefficient	r^2 Coefficient	Calculated F	Df	Sig F*	Variance	B	St. error	T Calculated	Sig t*
Reduction of production costs	0.757	0.573	483.867	1 360 361	0.000	organizational structures Engineering	0.748	0.034	21.997	0.000

* The impact is statistically significant at sig. (α ≤0.05)

The results of table (3) indicate that (r = 0.757), which means that there is a positive relationship between the dimension (organizational structures engineering) and the (production of the production costs). The value of the selection coefficient was (r2 = 0.573), which means that the dimension of the (organizational structures engineering) explained (57.3%) of the variance in the (reduction of the production costs), with other factors remaining constant. It also shows that the value of (F) was (483.867) at (Sig = 0.000), which confirms the significance of the regression at (α ≤0.05).

The coefficients table also shows that (β = 0.748) and that (t = 21.997) at sig. (Sig = 0.000), which confirms the significance of this coefficient at (α ≤0.05).

Based on the above, we reject the second sub-hypothesis and accept the alternative sub-hypothesis:

"There is a statistically significant impact for the organizational structures engineering on the reduction of the production costs in the Jordanian public industrial companies.

Sub-hypothesis 3 H01-3: There is no statistically significant impact for the human resources engineering on the reduction of the production costs in the Jordanian public industrial companies.

Results of testing the impact of the dimension of (HR Engineering) on the reduction of the production costs* Table (4)

Dependent variable	**Model Summery**		**ANOVA**			**Coefficient**				
	R Coefficient	**r^2 coefficient**	**Calculated F**	**Df**	**Sig F***	**Variance**	**B**	**St. error**	T **Calculated**	**Sig t***
Reduction of production costs	0.692	0.478	330.296	1 360 361	0.000	HR Engineering	0.659	0.036	18.174	0.000

* The impact is statistically significant at sig. ($\alpha \leq 0.05$)

The results of table (4) indicate that (r = 0.692), which indicates that there is a positive relationship between the dimension (human resources engineering) and the (reduction of the production costs). Furthermore, the value of r2 was 0.478, which means that the dimension (human resources engineering) explained (47.8%) of the variance in the (reduction of the production costs), with other factors remaining constant. Furthermore, the value of (F) was (330.296) at (Sig = 0.000), which confirms the significance of the regression at ($\alpha \leq 0.05$).

The table also shows that the value of β was 0.659 and the value of t was 18.174 at (Sig = 0.000), which confirms the significance of the coefficient at ($\alpha \leq 0.05$).

Based on the above, we reject the third sub-hypothesis and accept the alternative sub-hypothesis:

"There is a statistically significant impact for the human resources engineering on the reduction of the production costs in the Jordanian public industrial companies."

Sub hypothesis 4 H01-4: There is no statistically significant impact for the industrial processes technology on the reduction of the production costs in the Jordanian industrial companies.

Results of testing the impact of the dimension of the Industrial Processes Technology (IPT) on the reduction of the production costs* Table (5)

Dependent variable	Model Summery		ANOVA			Coefficient				
	R Coefficient	r^2 coefficient	Calculated F	Df	Sig F*	variance	B	St. error	T Calculated	Sig t*
Reduction of production costs	0.254	0.064	24.763	1 360 361	0.000	IPT	0.262	0.053	4.976	0.000

* The impact is statistically significant at sig. ($\alpha \leq 0.05$)

The results of table (16) indicate that r was 0.254; this means that there is a positive relationship between the dimension (industrial processes technology) and the (reduction of the production costs). The value of r2 was 0.064, which means that the dimension of the (industrial processes technology) explained (6.4%) of the variance in the (reduction of the production costs), with other factors remaining constant. It also shows that the value of (F) was (24.763) at (Sig = 0.000) and this confirms the significance of the regression at ($\alpha \leq 0.05$).

The table also shows that the value of β was 0.262 and the value of t was 4.976 at (Sig = 0.000), which confirms the significance of the coefficient at ($\alpha \leq 0.05$).

Based on the above, we reject the fourth sub-hypothesis and accept the alternative sub-hypothesis:

"There is a statistically significant impact for the industrial processes engineering on the reduction of the production costs in the Jordanian industrial companies."

Sub-hypothesis H01-5: There is no statistically significant impact for the improvement of the total quality standards on the reduction of the production costs in the Jordanian industrial companies.

Results of testing the impact of the dimension of (Total quality standards) on the reduction of the production costs* Table (6)

Dependent variable	Model Summery		ANOVA			Coefficient				
	R Coefficient	r^2 coefficient	Calculated F	Df	Sig F*	Variance	B	St. error	T Calculated	Sig t*
Reduction of production costs	0.154	0.024	8.719	1 360 361	0.003	Total quality standards	0.167	0.056	2.953	0.003

* The impact is statistically significant at sig. ($\alpha \leq 0.05$)

The results of table (6) indicate that r = 0.154, which means that there is a positive relationship between the dimension of (the improvement of the total quality standards) and (the reduction of the production costs). The value of the selection coefficient was (r2 = 0.024), which means that the

dimension of (the improvement of the total quality standards) explained (2.4%) of the variance in the (reduction of the production costs), with other factors remaining constant. It also shows that the value of (F) was (8.719) at (Sig = 0.000), which confirms the significance of the regression at (α ≤0.05).

The table also shows that the value of β was 0.167 and that the value of t was 2.953 at (Sig = 0.000), which confirms the significance of the coefficient at (α ≤0.05).

Based on the above, we reject the fifth sub-hypothesis and accept the alternative sub-hypothesis:

"There is a statistically significant impact for the improvement of the total quality standards on the reduction of the production costs in the Jordanian industrial companies."

Sub-hypothesis 6 H01-6: There is no statistically significant impact for the value engineering on the reduction of the production costs in the Jordanian public industrial companies.

Results of testing the impact of the dimension (value engineering) on the reduction of the production costs* Table (7)

Dependent variable	**Model Summery**		**ANOVA**			**Coefficient**				
	R Coefficient	**r^2 coefficient**	**Calculated F**	**Df**	**Sig F***	**Variance**	**B**	**St. error**	T **Calculated**	**Sig t***
Reduction of production costs	0.001	0.000001	0.0004	1 360 361	0.983	Value Engineering	0.0009	0.044	0.022	0.983

* The impact is statistically significant at sig. (α ≤0.05)

The results of table (7) show that r = 0.001, which means that there is a weak relationship between the dimension of the (value engineering) and (the reduction of the production costs). Also, r2 was 0.000001, which means that the dimension of the (value engineering) explained (0.0001%) of the variance in the (reduction of the production costs), with other factors remaining constant. Also, the value of (F) was (0.0004) at (Sig = 0.983); this confirms the insignificance of the regression at (α ≤0.05).

The table also shows that the value of β was 0.0009 and that t was 0.022 at (Sig = 0.983), which confirms the insignificance of the coefficient at (α ≤0.05).

Based on the above, we accept the sixth sub-hypothesis, which states that:

"There is no statistically significant impact for the value engineering on the reduction of the production costs in the Jordanian industrial public companies."

To test the main hypothesis, the multiple regression analysis was used; the results were as follows:

Results of testing the impact of the dimensions of the overall BPR on the reduction of the production costs* Table (8)

Dependent variable	Model Summery		ANOVA			Coefficient				
	R	R^2	F Calculated	Df	Sig F	Variance	B	St. error	T Calculated	Sig t
Reduction of production costs	0.774	0.600	88.647	6	0.000	trend towards decentralization	.007	.044	.157	.875
				355		organizational structures Engineering	.554	.055	10.026	.000
						HR Engineering	.225	.054	4.212	.000
						IPT	.027	.043	.621	.535
				361		Total quality standards	.035	.045	.780	.436
						Value Engineering	.025	.042	.588	.557

* The impact is statistically significant at sig. ($\alpha \leq 0.05$)

The results of the table (8) indicate that the correlation coefficient (R = 0.774) refers to the positive relationship between the independent variables and the dependent variable, and that the impact of the independent variables (the dimensions of the BPR) on the dependent variable (the reduction of the production costs) is statistically significant; the value of the calculated F was (88.647) at (Sig = 0.000) which is less than 0.05. The value of the selection coefficient was (R2 = 0.600) which shows that (60.0%) of the variance in the (reduction of the production costs) can be explained by the variance in the (dimensions of the BPR) all together.

The coefficients' table showed that the value of β for the dimension (trend towards decentralization) was (0.007) and that its t value was (0.157) at (Sig = 0.875), which indicates that the impact of this dimension was insignificant. The value of β at the dimension of the (organizational structures engineering) was (0.554) and its t value was (10.026) at (Sig = 0.000). This indicates that the impact of this dimension is significant. The value of β at the dimension (human resources engineering) was (0.225) and its t value was (4.212) at sig. (Sig = 0.000), indicating that the impact of this dimension is significant. The value of β at the dimension of the (industrial processes technology) was (0.027) and the t value was (0.621) by the level of significance (Sig = 0.535), which indicates that the impact of this dimension was insignificant at (Sig = 0.436), which indicates that the impact of this dimension is insignificant. The value of the β at the dimension (value engineering) was (0.025) and the t value was 0.588 by (Sig = 0.557), which indicates that the impact of this dimension was insignificant.

Based on the above, we reject the first major zero hypothesis and accept the alternative hypothesis: **"There is a statistically significant impact for the BPR on the reduction of the production costs in the Jordanian public industrial companies.**

7. Results and discussion.:

-Results:

depending on the results of the data analysis and the hypotheses testing, the study concluded the following results:

1. the Jordanian industrial companies apply the dimensions of the process reengineering in a medium degree since the sample members tended to apply these dimensions but without an absolute approval; the mean of the scale of the dimensions of the PR was (3.515) with a medium relative importance. This is an indication that the public industrial companies are seeking to apply the dimensions of the process reengineering; however, this was not at the level required.

2. the dimension of the (human resources engineering) was ranked first as one of the dimensions of the PR where the mean of the scale of the (human resources engineering) was (3.704) by a high relative importance. This is an indication that the managements of the Jordanian industrial companies do realize the importance of the human element in the development and innovation of processes, and its ability to use the tools of work and the modern technology in the best way.

3. The rest of the dimensions of the other process reengineering ranged from high to medium relative importance, with the latter ranked last by a mean of (3,345) with a medium relative importance. This is an indication that the trends of the sample members tended to be totally not approving the companies' 'adoption of an organizational structure that contributes to the development process and supports the innovation processes in the company. Furthermore, the trends of the sample members indicate that companies are not far away from the routine work, and that they do not seek to increase the interactions among the units, sections and departments in the company.

4. The results of the analysis showed that the Jordanian industrial companies seek to reduce the production costs in general, but this is not at the required level since the mean for the items of the (reduction of the production costs) was 3.461 by a medium relative importance. It has been shown that companies seek to rationalize their operating expenses by best optimizing the available resources with the use of a scientific method by applying the management accounting tools, such as the targeted cost, and reference comparisons, etc.

5. The results of the hypotheses test showed a significant impact for the dimensions of the overall BPR on the reduction of the production costs. The dimensions of the BPR were able to explain (60.0%) of the variance in the reduction of the production costs. The dimensions of the (human resources engineering) and the (organizational structures engineering) were characterized by the existence of the significant impact. However, the rest of the dimensions had no impact on the reduction of the costs when studying the dimensions combined although there was an impact for some of them when studying the dimensions individually. This is an indication for the importance of the impact of these two dimensions on the cost reduction. The existence of such an impact may be due to the importance of the human resources in the optimal utilization of resources, and to the importance of the formation of the organizational structures for the flow of information and processes related matters.

- Recommendations:

Based on the results obtained, the researcher recommends:

1- The need that the departments in the industrial companies stay away from the routine work, and follow modern methods and administrative methods, to coordinate the tasks among the internal units and increase the interaction among them. This is done for the purpose of ensuring that the organizational structure contributes to encouraging cooperation and communication between the

departments and the employees to exchange experiences and knowledge for developing the job environment, increase the efficiency of the internal processes and reduce the costs.

2- not making the decision-making process only limited to the senior administrations, expanding the powers exercised by the middle and lower administrations, moving away from the centrality of decision-making to qualify all the administrative levels to take responsibility, and making decisions at the right times and in cases of crises to avoid losses and the loss of investment and sales opportunities.

3- Providing an appropriate and safe job environment for employees by providing the occupational safety requirements, and ensuring the employees against the risk of injuries at work with the aim of increasing the level of the job satisfaction that contributes to increasing the effectiveness and efficiency of employees' performance, thereby reducing the costs.

4- Providing the necessary IT infrastructure to support processes, increasing the effectiveness of the communication between the teams, and allowing employees to obtain the necessary information to complete the tasks required of them at the right time.

5- Spreading the culture of quality among employees through training and educating them in the importance of quality, and getting access to the quality standards through a guide on the quality standards with the aim of linking the process of the reduction of the production costs to the quality standards.

6- The need to encourage the management for a free presentation, creativity and innovation, and to provide incentives to creators for the aim of supporting the stages of the value chain, as these things play the role of improving the value of goods and products, assessing the efficiency of the internal processes, solving problems correctly, and avoiding potential losses.

7- Companies should seek to build relationships with several suppliers, and not to be satisfied with a single supplier, in order to ensure access to direct and indirect raw materials with the quality needed, speed and low cost, to reduce the time spent in production, and to reduce the production and operation costs.

Referrals and references:

Alabbadi, H. A.-A. (2011). *The role of the knowledge management in the BPR for the transfer from the physical to the informative limit: an applied study in the Babel tires factory.* Iraq: Kufa University.

Al-Dajani, I. (2010). *A proposed model for the BPR and computerizing it in the higher education institutions: a case study.* Gaza: Islamic University.

AL-Dawi. (2008). conducted a study entitled "The impact of the re-engineering process on the development of the banking service in the National Bank of Algeria. Récupéré sur https://manifest.univ-ouargla.dz/archives/archive/facult%C3%A9-des-sciences-economiques-,-de-gestion-et-des-sciences-commerciales/84-%D8%A7%D8%B5%D9%84%D8%A7%D8%AD-%D8%A7%D9%84%D9%86%D8%B8%D8%A7%D9%85-%D8%A7%D9%84%D9%85%D8%B5%D8%B1%D9%81%D9%8A-11%D9%8812-

Al-Qassimi, M. (2009). Activating business engineering tasks from the perspective of information technology and communications integrative portal. Récupéré sur https://kenanaonline.com/users/ahmedkordy/posts/782673?fbclid=IwAR3GLKxJWs2kWq2Rq_NeslzuYA2cz8L_MmWQxYNP2-605gpJkeEP9Bp7cZE

AlSir, A. J. (2008). *The reality of the business processes engineering in the Ministry of Interior and National Security in the Gaza Strip.* Gaza: Islamic University.

Azhar, Z. N. (2013). The role of TQM and BPR in executing quality improvement: a comparative study. *European Journal of Business and Management, 5*(1), pp. 1-10.

Janin, R. G. (2009). Evolving role of business process reengineering: a perspective of employers. *Industrial & Commercial Training, 41*(7), pp. 382-390.

Khadiri, M. F. (2012). How workflow system facilitate business process reengineering and improvement. *International Journal of Computer Science issues (IJCSI), 9*(1), pp. 447-461.

Khalil, A. (200). *The role of operations engineering in supporting cost-cutting decisions under the philosophy of change management.* Jordan: Zaytouna University.

Khan, A. (2012). Processes Re-engineering: introduction for the human resources management excellence. *Economic and administrative research, 12*, pp. 168-195.

Sekaran, U. (2000). *Research Method for Business* . New York: John Wiley & Sons.

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