

The Effect of Applying Accounting Information Systems on the Improvement of Production Costs (An Applied Study on Jordanian Industrial Firms Listed in Amman Stock Exchange)

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Abstract: This study aimed at identifying the degree of applying accounting information systems (Accounting system efficiency, decreasing production costs and the identification of costs' deviations) and their effect on the improvement of production costs among Jordanian industrial firms. For the purposes of the present study, questionnaire was developed and distributed to the participants of the study (n = 160) who were chosen from among financial managers and accountants at Jordanian industrial firms. Results of the study showed that industrial firms implement accounting information systems efficiently and effectively and that the most important degree of implementation is that the system seeks to identify the deviations of the production costs to a large degree. Results showed so the existence of a positive effect of the adoption and implementation of accounting information systems which is related to the identification of production costs' deviations, the efficiency of the accounting information systems and the improvement of the production costs.

Key words: Accounting information systems, production cost, shareholding, Jordanian industrial firms, effective factor, capacity

INTRODUCTION

Accounting information system is considered among the most important minor systems within the administrative system at the facility which is due to the financial data derived from it and which are needed by the internal and external parties and which are the result of inputs processing which include economic data and events. Accounting information systems is the basis of the different administrative levels which assist them in achieving their goals. In order to operate efficiently, the system depends on the inputs, both external and internal which yield information consequently. The outcomes differ based on the inputs that vary among different organizations.

The function of the costs accounting systems is related to specifying, classifying and allocating the actual costs which emerged or emerging (planned and standard costs) within a certain period as well as the identification of the causes of deviations and providing the required information to the decision makers, especially those related to the pricing policies. In order to achieve these goals, costs are specified and classified based on their types, so that each center has its isolated cost and its

allocation. This aids in identifying the amount, percentage and point of emergence for each costs' type as well as facilitating the process of costs' distribution based on the principle of causes within a certain period of time.

This study aimed at proposing a theoretical framework for the concept of accounting information system as well as assisting in improving production costs by achieving the following aims:

- Identifying the scope of accounting information systems' adoption among Jordanian industrial firms
- Identifying the scope of improvement in production costs among Jordanian industrial firms
- Exploring the effect of the adoption of accounting information systems on the improvement of production costs among Jordanian industrial firms
- Providing a set of recommendations which assist managers' decision making and accountants in improving production costs among Jordanian industrial firms

Problem of the study: The problem of the study is related to answering the following questions:

- Is there an adoption and implementation of accounting information systems among Jordanian industrial firms listed in Amman Stock Exchange?
- Is there an improvement in production costs among Jordanian Industrial firms listed in Amman Stock Exchange?
- Is there an effect of the adoption of accounting information systems and their relevant dimensions (the efficiency of the accounting system, measuring production costs, decreasing production costs and the identification of the deviations in production costs) On the improvement of production costs among industrial firms listed in Amman stock exchange?
- There is no effect for the efficiency of the accounting system on the improvement of production costs among Jordanian industrial firms
- There is no effect for the decrease in production costs on the improvement of production costs among Jordanian industrial firms
- There is no effect for the identification of the deviations of production costs on the improvement of production costs among Jordanian industrial firms

Importance of the study: The importance of this study is related to the fact that it deals with an important topic in administrative accounting which is namely the improvement of production costs which is the essential means for achieving the goals of industrial firms effectively and efficiently and the success of their durability. Additionally, this study provides a realistic assessment of the scope of employing accounting information systems in guiding administrative decisions among Jordanian industrial firms and an assessment of the scope of investment related to the data provided through these systems in relation to guiding decisions and the identification of available alternatives and the characteristics of each alternative, especially the decisions related to the improvement of production costs.

The practical importance of this study is relate to the attempt at enhancing the attempts of managers, accountants and audits at the industrial firms in order to identify the weaknesses and strengths of their accounting systems and the way to develop those systems, so that they achieve higher outcomes in terms of the provision of accounting information at the right time, so that they assist decision makers in those firms. This will be achieved thought exploring the effect of the accounting information system on the improvement of the production costs and the identification of the essential component of those systems that contributes to the realization of the main effect on auditing production costs. Additionally, this study contributes to the theoretical literature on accounting in the Arab region in general and Jordan in particular through its results and recommendations.

Hypotheses of the study: Hypotheses of the present study were formulated as null hypotheses as follows:

Hypothesis 1: Adoption of accounting information systems is absent among Jordanian industrial firms. This hypothesis can be divided into the following minor-hypotheses:

Review of literature: Several studies explored accounting information systems and the improvement of production costs which include: Al-Yahiya and Haidari Talal (2004) aimed at specifying the effects of using administrative information systems, computerized on decision-making at the Hussein Medical City as well as specifying the differences between the effects on administrative decisions, compared to medical decisions. This study aimed also at analyzing the actual situation of the scope of computerized information systems' employment among different departments as well as the effects of those systems on the medical and financial areas. The study aimed also at identifying the main limitations and barriers to their adoption in addition to the identification of the main types of systems in terms of their use. Results of the study suggest that the systems facilitated the process of preparing financial reports for the higher management, preparing and providing monthly payroll and the wages of employees, facilitating comparing the estimated expenses to the actual expenses and finally, facilitating real costs accounting for the various activities at the hospital.

Moqbel (2014) study examines the effect of accounting information systems for listed companies in the services sector in the Amman Stock Exchange on E-commerce using three main aspects: The presence accurate accounting information system imposes on companies that the development of its methods to handle e-commerce, the effects on accounting information systems under the e-commerce will relate to influence the components of accounting information systems and the last one is the effects on accounting information systems under the E-commerce will change the resources of the physical and human resources companies.

Moqbel and Alrjoub study (2014) this study examines the evaluation of the relationship between accounting information systems and standard costs, researchers have used a sample of 27 insurance companies belonging to the insurance sector listed on the Amman Stock Exchange Securities, the study discussed at several major themes are: the standard cost system as partial of the cost accounting information system and has a strong

relationship with the budgeting system. Evaluation of performance using a standard cost system as a method of cost control. Standard costing system remains appropriate with the new business environment. The study found many of the results was the most important focusing on objective accounting information system and the possibility to support the standard costs, so as to ensure make true decisions or correct decisions taken previously, this would preserve the continuity of the enterprise and increases the useful life or its product age and guarantee them a competitive advantage in the business environment.

AL-Soghayyer and Fatah Allah (2005)'s study aimed at explaining the role of accounting information systems on the supervising credit facility among Libyan commercial banks through accounting information provided by the available information systems, through the identification of the characteristics of those systems and the information they provide and the relation between credit and the accounting information provided by the systems used among Libyan financial banks. Findings of the study suggest that information systems employed at Libyan banks are efficient in general and that the accounting information they provide are characterized by qualitative characteristics which make them suitable for auditing credit provision due to the fact that they are modern, easy to use, reliable and provide information at the right time, so they can be relied upon in making relevant decisions.

The study of Al-Shelby and Hussain (2004) aimed at exploring the role of accounting information systems in auditing through the use of the conditional theory in order to identify how facilities apply information systems realistically as well as to identify the sources and reasons behind this level of application. The actual use of the accounting information and the variable factors of the conditional theory and their role in interpreting those causes are explored also. In order to achieve the purposes of the present study, a questionnaire was developed and distributed to a sample consisting of 30 accountants at the Saudi Airlines Company. Results of the study suggested that the administrative use of the accounting information systems employed are not advanced and were designed on the basis of traditional services' facilities. Conditional factors had their effect on the administrative use of the accounting information and that effect varies based on the different factors which calls for solution in order to increase the efficiency of the accounting information.

The study of Judah and Ibrahim Nasser (2004) aimed at exploring the accounting information systems employed at the directorate of income tax and their effect

on the efficiency of the directorate in Jordan through the effect of the development of the accounting information systems and the administration attempts at providing qualified staff as well as material resources for the information directorate. The sample of the study included (14) employees at the directorate of income tax. The results showed that the efficiency of the directorate is affected by the various variables. The study recommended increasing the number of the staff at the information department and providing training to the cadre, so that it become able to deal with the systems and information's available.

The study of Awad (2004) aimed at exploring the effect of the cost of commodities' requirements on the production cost at the industrial facilities as one of the factors of production for the purposes of auditing and supervising the available factors of production and measuring the factor of the commodities' requirements. Results showed the absence of a department whose role is related to the reception and inspection of the purchased commodities' requirements as well as the lack of policies related to the training and qualifying the accountants. Results showed also that the costs accounting department is headed by the financial manager which affects the accounting and auditing role of the department.

The study of Ismail *et al.* (2007) aimed at identifying the factors which affect the use of accounting information systems at medium and small factories in Malaysia. The sample of the study consisted of (214) firms employing accounting systems. The study found that the use of information systems in a way that relates upper and lower information assist the workers and employees in achieving their goals. Additionally, the use of these systems enables the provision of accurate information to the relevant governmental agencies by the firms.

The study of Brazel and Agoglia (2004) aimed at exploring the effect of the information systems' audit in terms of his efficiency and experience on the estimates of the external audits in the accurate plashing of auditing in the light of the modern complications in the environment of accounting information systems. For the purposes of the study, two values were assigned to the efficiency of the information system audit: high efficiency and low efficiency. And the experiences of audits were calculated. Results of the study showed that both the efficiency of the audit of the information system and his experience affect significantly the evaluation of the risks of auditing as part of the accurate planning. The reaction of the (X) audit to the change in the efficiency of the information system depended on the experience of the accounting audit in terms of accounting information systems.

MATERIALS AND METHODS

Sources of information: For the purposes of the present study, two sources of information which are:

- Secondary sources-reviewing books, articles theses related to the topic of the study in order to clarify the concepts relevant to the study and the variables of the study, their causes and effects in order to formulate the hypotheses of the study and enriching the discussion
- Primary sources: this study can be described as a field study aiming at collecting primary data and employs the descriptive analytical method in order to identify the attitudes of financial managers and accountants at the Jordanian industrial firms concerning the effect of applying accounting information systems on the improvement of production costs. In order to test the hypotheses of the study, a questionnaire was used and its items were developed based on the relevant theoretical framework and the previous literature.

Tool of the study: The tool of the study is a questionnaire that was developed by the researcher for the purposes of the study. The questionnaire consisted of two sections:

First section: Which aimed at collecting demographic data about the participants within. The sample of the study which included the academic qualification, academic specialization, practical experience and the job title.

Second section: Which consisted of four areas, the first contained 6 items related to measuring the efficiency of the accounting information system, the second area which contained 6 items related to measuring the decrease in the production costs, the third area consisted also of 6 items related to the identification of deviation, these three areas represented the independent variables of the study. The fourth area which consisted also of 6 items was related to the level of improvement in the production costs among Jordanian industrial firms and which represents the dependent variable of the study.

The researcher used a five point Likert scale in order to identify the degree of agreement of the study participants with the content of the items and transforming them into quantitative data that can be analyzed statistically (Shwiyat and Ziyad Mustafa, 2013) and were given the weights illustrated in Table 1.

In order to identify the degree of the importance of each item within the tool of the study, a statistical

Table 1: Degrees of the Likert scale used in the study

Scale point	Strongly				Strongly disagree
	agree	Agree	Neutral	Disagree	
Degree of agreement	5	4	3	2	1
Relative weight (%)	81-100	61-100	41-100	21-40	0-20

standard based on classifying the means into three classes (1<2, 3) indicates a low level, (from 2.5<3.5) indicates a medium degree and (3.5-5) which indicates a high level were used.

Population and sample of the study: The population of the study consists of the financial managers and accountants working at the corporate Jordanian industrial firms listed in Amman Stock Exchange in the year (2014) and whose total number is (72) firms (the guide to the Jordanian industrial firms, 2014). The sample of the study was chosen randomly and consisted of 40 firms (56% of the population of the study. Questionnaires were filled by financial managers and accountants (4 questionnaires for each firm). Thus, the sample consisted of 160 individuals. The 148 questionnaires were returned from which 6 were eliminated due to the incomplete information they contained. So, the total number of questionnaires which were analyzed is 142 with a percentage of response at (88.7%).

Statistical processing used in the analysis of data: In order to analyze, the data of the study items, the SPSS software was used. Several statistical methods were employed in order to achieve the purposes of the study which included:

- Central tendency measures: means, standard deviation and frequencies were calculated
- Pearson Correlation Coefficient test
- Alpha Cronbach test
- Simple linear regression analysis in order to test the effect of each independent variable on the dependent variable (improving the financial performance)

Tests related to the tool

First: validity of the tool: This process aims at checking whether the tool used in this study measures actually the construct it was developed to measure (Sekaran and Uma, 2013). Validity tests employed in this study included:

Face validity: which is the process of ascertaining that the items contained in the tool of the study results in collecting accurate data (Sekaran and Uma, 2013). In order to achieve this, the researcher sent the questionnaire to a number of referees to check the clarity of the items, their ease and comprehensiveness. The researcher undertook the adjustments for the items which are difficult to understand.

Table 2: Pearson correlation coefficients related to the content validity of the items

Order	Area	No. of items	Correlations coefficients' average for the items
First	Efficiency of accounting information systems	6	0.609
Second	Decreasing production costs	6	0.703
Third	Identifying deviations of production costs	6	0.704
Fourth	Improving production cost	6	0.618

Content validity: which was measured by measuring the relations between the items and the areas and dimensions they belong to. Attention was focused on ascertaining that each dimension is represented accurately by its items appropriately and that the items measure their dimensions (Sekaran and Uma, 2010) and the content validity of the questionnaire through measuring the relation between the items and the dimensions they represent by using Pearson correlation coefficient. The confidents higher than (30%) were employed with the significance level at $(0.05 \geq \alpha)$ (Nunnally, 1978). Table 2 shows these relations.

Pearson correlation coefficients related to the measurement of the content validity of the items of the areas of the study.

Table 2 shows the results of Pearson correlation coefficients among the items and the areas of the study. The values of correlation coefficients and the levels of significance shows the presence of statistically significant relation $(0.01 \geq \alpha)$ among the items of the area which indicates the construct validity of the items.

Second; reliability of the tool: Reliability refers to the possibility of collecting similar data on replicating the study on the same participants and in similar conditions (Sekaran and Uma, 2013). Internal consistency measure (cronbach alpha) was applied to the responses of the study sample participants in order to determine the reliability of the tool of the study. The value that is statistically acceptable in this context is (60%) at least. Table 3 shows this.

Table 3 shows the results of cronbach alpha for the areas of the study. Reviewing the values shows that they are high with the lowest value being related to identifying the deviation (0.719) while the value for the tool as a whole was (0.905). All the values of cronbach alpha which were calculated for the purposes of the study were suitable which indicates a high reliability of the questionnaire.

Characteristics of the sample of the study: The sample of the study consisted of 142 individuals working at the Jordanian industrial firms. Table 4 shows the distribution of the sample participants according to the personal variables.

Table 3: Cronbach Alpha consistency coefficients for the areas of the study and the tool as a whole

No. of areas	Title of areas	No. of items	Correlations coefficients (internal consistency)
1	Efficiency of accounting information systems	6	0.744
2	Decreasing production costs	6	0.732
3	Identifying deviations of production costs	6	0.719
4	Improving production cost	6	0.719
	Total average of performance	24	0.905

Table 4: The distribution of the participants of the study according to personal variables

Variables (categories)	Frequencies	Percentage
Academic qualification		
Diploma-lower	21	0.148
B.A	106	0.746
Higher education degrees	15	0.106
Specialization		
Accounting	117	0.824
Accounting information systems	18	0.127
Finance and accounting	7	0.049
Job experience		
<5 years	15	0.106
From 5<10 years	62	0.437
From 10<15 years	42	0.296
15 years or more	23	0.162
Job title		
Financial manager	13	0.092
Financial manager assistant	11	0.077
Head of accounting department	31	0.218
Accountant	87	0.613
Total	142	100.000

Table 4 shows that the highest percentage of the participants of the study based on the variable of the academic qualification is the bachelor degree (74.6%). Higher education percentage was (10.6%) and the lowest percentage was for the diploma and lower which suggests that the population of the study is educated that (89.8%) of the sample of the study hold higher education degrees which enhances the reliability of the results of the study. Concerning the academic specialization, results showed that the majority of the participants are specialized in accounting (82.4%) and that (89.4%) had an experience of >5 years. The results indicated also that the majority of the employees have the job titles of accountants which refers to the reliability of their responses which indicates also the high reliability of the study results.

RESULTS AND DISCUSSION

First: adoption of accounting information systems
I-efficiency of the accounting information systems: Table 5 shows the means and standard deviations of the efficiency of the accounting information system variable from the perspective of the participants of the study sample working at the Jordanian industrial firms ordered based on their importance which is determined through their means.

Table 5: The attitudes of the participants of the study concerning the efficiency of the accounting information systems

Order	No.	Items	Mean	SD	Degree
1	6	Accounting information system provides financial information with a high predictive power which assist the management in formulating future plans	4.43	0.63	High
2	4	the accounting information systems provide a basis for planning financial and human resources	4.17	0.61	High
3	2	The accounting information system at the company provides information for the managers to make decisions not based on personal judgments	4.04	0.73	High
4	1	The accounting information system at the company provides feedback so that decisions made are reviewed and improved	3.98	0.84	High
5	5	Using accounting information systems contributes greatly to increasing the efficiency of the planning process	3.91		High
6	3	accounting information systems provide additional information (Analytical lists, statistical tables, diagrams et) which assist the administration in comparing and evaluating performance be her	3.80	1.05	High
General tendency			4.05	0.43	High

Table 6: Attitudes of the participants of the study concerning degreasing production costs

Order	No.	Items	Mean	SD	Degree
1	5	Accounting information systems specify the indirect materials for every new order based on the reports of the specialized team	4.41	0.86	High
2	3	Accounting information systems assist in controlling the wages through the control of their indirect costs	4.24	0.51	High
3	1	Accounting information systems provide special systems for the warehouses, connected to all sections of the company and the general management	4.11	0.69	High
4	6	Accounting information systems specify the working time required for completing the production process	4.11	0.88	High
5	4	Accounting information systems provide accounting systems capable of estimating the indirect wages related to the product and controlling their deviations	3.91	0.81	High
6	2	Accounting information systems provides a category card for each material to the warehouses' attendant in order to supervise the inventory	3.48	1.06	Medium
General tendency			3.96	0.41	High

Table 5 shows also that the attitudes of the participants in the study sample were very high towards all the items related to the efficiency of the accounting information systems which ranged between (3.80-4.43); reviewing the order of the items shows that the item stating that “Accounting information system provides financial information with a high predictive power which assist the management in formulating future plans” which was ranked first with a mean of (4.43) and a standard deviation (0.59).

The item which states that “the accounting information systems provide a basis for planning financial and human resources” was ranked second, with a mean of (4.17) and a standard deviation of (0.16). The item which states that “accounting information systems provide additional information (analytical lists, statistical tables, diagrams et) which assist the administration in comparing and evaluating performance better” was ranked first with its mean at (3.80) and its standard deviation (1.05) in comparison to the general mean.

In general, the total results suggest the presence of a high level of efficiency for the accounting information system, the mean for which was (0.43) which is relatively low, indicating that the attitudes are similar with the absence of variance among the responses of the participants of the study concerning the variables of the study.

Decreasing production costs: Table 6 shows the means and standard deviations of the variable of decreasing

production costs from the perspective of the participants within the sample of the study, working at Jordanian industrial firms ranked based on their importance according to their means.

Table 6 shows that the attitudes of the participants of the study sample were highly important towards all the items related to the efficiency of the accounting information system, except item number 2 which had a medium importance which ranged between 3.48-4.41. Reviewing the order of the items, it is found that the item which states that” accounting information systems specify the indirect materials for every new order based on the reports of the specialized team” was ranked first (Mean = 4.41, SD = 0.86). the item which states that “Accounting information systems assist in controlling the wages through the control of their indirect costs” was ranked second (Mean = 4.24, SD = 0.51) while the item which states that “accounting information systems provides a category card for each material to the warehouses’ attendant in order to supervise the inventory” was ranked last (Mean = 3.48, SD = 1.06) in comparison with the general means. In general, the total results suggest the presence of a high level of reduction in production costs with the mean being at (3.96) and the standard deviation at (0.41) which is low, indicating the similarity among attitudes and the absence of central variance among the responses of the participants of the sample working at Jordanian industrial firms concerning the variables of the study (Table 7).

Table 7: Attitudes of the participants concerning the identification of the deviations of production costs

Order	No.	Items	Mean	SD	Degree
1	4	Accounting information systems provide standards and supervisory indicators which enable the management to discover the deviations, analyzing their causes and resolving them	4.60	0.61	High
2	2	Accounting information systems provide an analysis of the deviations of the indirect industrial costs which account for a high percentage of the total costs	4.46	0.68	High
3	6	Accounting information systems assist in supervising the efficiency of decisions made at the company and determining their deviations	4.32	0.68	High
4	1	Accounting information systems provide a comprehensive database that determines the deviations of direct and indirect materials	4.22	0.93	High
5	5	Accounting information systems assist in exploring the elements of production for the previous periods and suggesting the future costs	4.16	0.91	High
6	3	Accounting information systems assist in distributing indirect industrial costs and the identification of their deviations from what is planned	4.12	0.68	High
General tendency			4.35	0.58	High

Table 8: The attitudes of the participants of the sample of the study concerning improvement of production costs

Order	No.	Items	Mean	SD	Degree
1	4	Management works to increase the cost' clusters in which indirect costs are calculated based on the number of activities incurring costs	4.34	0.77	High
2	1	Management uses information systems in order to use what is available of resources in order to satisfy its needs in terms of production and pricing	4.28	0.78	High
3	6	Management tries to develop administrative performance and decrease costs through the elimination of activities which do not add value	4.20	0.70	High
4	2	Management uses accounting information systems which enable it to plan auditing costs better throughout the value chain from R&D and to customer service	4.18	0.72	High
5	3	Management tries to provide the sufficient number of costs employees who are able to operate costs systems efficiently and effectively	3.98	0.84	High
6	5	Management seek to apply the recommendations of the costs' team in order to improve costs and achieve what has been planned	3.92	0.90	High
General tendency			4.14	0.46	High

Identifying the deviations in production costs: Table 7 shows the means and the standard deviations of the production costs from the perspective of the participants of the sample of the study from among the employees at the Jordanian industrial firms ranked according to their importance, based on their means.

Table 7 shows that the attitudes of the participants of the study were highly important towards all the items related to the identification of the production costs which ranged between (4.12-4.60). Reviewing the order of the items shows that the item which states that “accounting information systems provide standards and supervisory indicators which enable the management to discover the deviations, analyzing their causes and resolving them”, was ranked first with a mean of (4.60) and a standard deviation of (0.61) while the item which states that “accounting information systems provide an analysis of the deviations of the indirect industrial costs which account for a high percentage of the total costs” was ranked second with its mean (4.46) and standard deviation (>0.68) the item which states that “accounting information systems assist in distributing indirect industrial costs and the identification of their deviations from what is planned”, was ranked last (mean = 4.12 and standard deviation = 0.68) compared to the general and total standard deviation. In general, results the presence of a high level of the ability of the accounting information

systems at the identification of the deviations of the production costs (mean = 4.35 and SD = 0.58) which is relatively low, indicating the similarity of the attitudes and the absence of high variance among the responses of the participants of the sample of the study from among the employees at the Jordanian industrial firms concerning the variables of the study.

Second; improving production costs: Table 8 shows the means and the standard deviations for the variable of improving production costs from the perspective of the participants of the sample of the study who work at Jordanian Industrial firms ranked according to their importance based on their means.

Table 8 shows that the attitudes of the towards all the items related to the improvement of production costs and ranged between (3.92-4.34).

Reviewing the ordering of the items we found that the item which states that “management works to increase the cost' clusters in which indirect costs are calculated based on the number of activities incurring costs” was ranked first, with a mean of (4.34) and a standard deviation of (0.77). The item which states that “management uses information systems in order to use what is available of resources in order to satisfy its needs in terms of production and pricing” was ranked second with its mean at (4.28) and standard deviation of (0.78).

Table 9: Employment of accounting information systems

t	Variables	Mean	SD	t-value	Freedom degrees	Significance level
1	Efficiency of accounting information system	4.05	0.43	11.992	141	0.000*
2	Decreasing production costs	3.96	0.41	8.757	141	0.000*
8	Identification of deviations of production costs	4.35	0.58	16.838	141	0.000*
	Level of total implementation	4.12	0.39	15.017	141	0.000*

*Statistically significant at $\alpha = 0.05$

Table 10: Results of multiple regression analysis of the effect of employing accounting information systems on the improvement of production costs

Independent variables	Significance level	R ²	Calculated "f"	Listed "f"	Statistical decision
Implementation of accounting information systems	0.002	0.401	4.022	0.003	Rejecting the null hypothesis

Table 11: Results of simple regression test for the effect of the efficiency of the accounting system on the improvement of production costs

Independent variables	Significance level	R ²	β_i	Calculated "t"	Listed "t"	Statistical decision
Implementation of accounting information systems	0.002	0.189	0.435	3.348	1.657	Rejecting the null hypothesis

The item which states that "Management seek to apply the recommendations of the costs' team in order to improve costs and achieve what has been planned" was ranked last (Mean = 3.92 and SD = 0.90) in comparison to the total mean.

Generally, the results indicate the presence of a high level of improving production costs among Jordanian industrial firms (Mean = 4.14 and SD = 0.46). This indicates the similarity among attitudes and the absence of large variance in the responses of the participants of the study from among the employees at Jordanian industrial firms concerning the variables of the study.

Testing the hypotheses of the study

Testing the first hypothesis: The first hypothesis states that "there is no adoption of accounting information systems among Jordanian industrial firms". In order to test this hypothesis, the variable of the adoption of accounting information systems into three variables which were explained previously. Table 9 shows the results of testing the first hypothesis.

Results indicated that all the variables of the study were statistically significant at the level of (0.01).

Results suggest that the mean of the level of accounting information systems adoption was at (4.12) with a standard deviation of (0.39) which indicates that industrial firms employ accounting information systems effectively and efficiently and the (+) value (15.017) was statistically significant at the significance level of (1%). Thus, the first null hypothesis is rejected and the alternative hypothesis accepted: "there is an adoption of accounting information systems among Jordanian industrial firms".

Testing the second hypothesis: This hypothesis indicates that "there is no effect systems on the improvement of production costs among Jordanian industrial firms". In order to test this hypothesis, multiple regression analysis was carried out in order to identify the effect of

accounting information systems on the improvement of production cost among Jordanian industrial firms from the perspective of the financial managers and accountants who work at Jordanian industrial firms listed in Amman Stock Exchange as it is shown in Table 10.

Table 10 shows that the calculated value of "f" was (4.22) while its listed value was (3.00). Through, the comparison between the values derived through this hypothesis; it was found that the calculated value was higher than the listed value so, the null hypothesis was rejected and the alternative hypothesis which states that "there is an effect for the adoption of accounting information systems on the improvement of production costs among Jordanian industrial firms" was accepted.

This is confirmed by the significance level (0.002) which is less than the level of significance 5%. Results indicated also that the variance in the employment of accounting information systems account for (0.401) of the variance of the improvement in production costs which reflects the strength of the relation.

Additionally, the level of relation between the variable of adoption of accounting information systems and the variable of improvement in production costs. The 0.599 of the changes occur in the improvement of production costs as a result of other unspecified variables which shows the importance of adopting accounting information systems.

Testing the minor hypotheses: In order to test the effect of employing accounting information systems in improving production costs among Jordanian industrial firms for each variable in isolation, the main hypothesis was divided into three secondary hypotheses. Simple regression analysis was used to test the secondary hypotheses.

The decision basis for the test indicates the rejection of the null hypotheses (H₀) and accepting the alternative hypothesis (H_a) if the calculated (T) value is higher than its listed value, at the significance level of (5%) (Malhotra, 2003). Table (11-13) show the results of this test.

Table 12: Results of simple regression test of the decrease of production costs on the improvement of production costs

Independent variables	Significance level	R ²	β _i	Calculated “t”	Listed “t”	Statistical decision
Decreasing production costs	0.020	0.145	0.144	0.2888	1.657	Rejecting the null hypothesis

Table 13: Results of simple regression test for the identification to the deviations of production costs on the improvement in production costs

Independent variables	Significance level	R ²	β _i	Calculated “t”	Listed “t”	Statistical decision
Identifying the deviations of production costs	0.000	0.221	0.509	3.124	1.657	Rejecting the null hypothesis

Testing the first minor hypothesis: This hypothesis states that “there is no effect for the efficiency of the accounting system on the improvement of production costs at the Jordanian industrial firms” for the purposes of testing this hypothesis simple regression analysis was used. Table 11 shows the results related to the test of this hypothesis.

Table 11 shows that the calculated value of (T) was (3.348) while its listed value was (1.657). Comparing the values derived through the test of this hypothesis, it is found that the calculated value is higher than the listed value so, the null hypothesis is rejected and the alternative hypothesis is accepted and which states that “there is an effect for the efficiency of the accounting information system on the improvement of production costs among Jordanian industrial firms” which is lower than (5%). The effect levee Bi was (0.435) which can be explained by the fact that the efficiency of the accounting system leads to improvement in production costs. Results suggest also that the variance in the efficiency of the accounting system accounts for (0.189) of the variance in the improvement in production costs which reflects the medium level of the strength of the relation as well as the level of interpreting of the variable of improving production costs through the variable of the efficiency of the accounting information system from the perspective of the financial managers and accountants. The 0.811 of the exchanges in the improvement of production costs are a result of different variables which shows the importance of the efficiency of the accounting system.

Testing the second minor hypothesis: This hypothesis states that: “there is no effect for the decrease in production costs on the improvement of production costs among the Jordanian industrial firms”. In order to test this hypothesis, simple regression analysis was used. Table 12 shows the results derived in testing this hypothesis.

Table 12 shows that the calculated value of T was (2.888) while its listed value was (1.657). Complaint the values derived in testing this hypothesis it was found that the calculated value is greater than the listed value, thus the null hypothesis is greater than the listed value, thus the null hypothesis is rejected and the alternative hypothesis is accepted which indicates that “there is an effect for the decrease in production costs on the

improvement in production costs among the Jordanian industrial firms” which is confirmed by the significance level (0.002) which is below the significance level of 5%. The effect value Bi was (0.414) which can be explained by the fact that decreasing production costs results in improvements to the production costs. Results suggest also that the variance in professional skills related to internal auditing account for (0.145) of the variance in the improvement of the strength of the relation as well as the degree of relation between the variable of decreasing production costs from the perspective of financial managers and accountants. The 0.885 of the changes I the improvement in production costs are the result of other changes which shows the importance of decreasing production costs.

Testing the third minor hypothesis: The third hypothesis states that: “there is no effect for the identification of deviations in the production costs on the improvement of production costs among the Jordanian industrial firms. “in order to test this hypothesis, simple regression analysis was used. Table 13 shows the results of testing hypothesis 3.

Table 13 shows that the calculated value of (T) was (3.124) while its listed value was (1.657). Comparing the values derived through testing this hypothesis, it was found that the calculated value is greater than the listed value and thus, the null hypothesis is rejected and the alternative hypothesis was accepted and which states that “there is an effect for the identification of the deviations in production costs on the improvement of production cost at the Jordanian industrial firms”. This is confirmed by the significance level which was at (0.000) which is lower than the significance level of (5%) and the effect Bi (0.509) which is explained by the fact that limiting the deviations of production costs results in improvement in the production costs. Results showed also that the variance in limiting the deviations in production costs accounts for (0.221) of the variance in the improvement in production costs which reflects the medium level of the strength of the relation. The degree of the correlation between the deviations in the production costs and the improvement in production from the perspective of financial managers and accountants. Additionally, 0.779 of the changes that occur to the improvement in

production costs are the result of other changes which reflects the importance of limiting the deviations of production costs.

Through the analysis, testing and discussing of the hypotheses of the study, the study arrived at the following important results:

- Industrial firms employ accounting information systems efficiently and effectively. The most important degree of employment is the system's limiting of the deviations of production costs and to a high degree
- A high degree of efficiency exists in the accounting information systems used by the Jordanian industrial firms and that the system provides financial information which are highly predictive and which assist the management in formulating the future plans
- Using accounting information provides a decrease in production costs among Jordanian industrial firms to a high degree, so that it attempts at limiting and identifying the amount of indirect materials for each order in advance based on the report of the specialized team
- Accounting systems enjoy a high ability at identifying the deviations, I production costs in order to provide standards and supervisory indicators which enable the management to discover the deviations, analyze their causes and solving them
- Jordanian industrial firms seek to increase the costs clusters in which the indirect costs are accumulated based on the number of activities that accrue costs as well as the development of administrative work and decreasing the costs through the elimination of the activities that do not add value for the purposes of improving production costs
- Employing accounting systems related to decreasing production costs is considered among the most influential function which improve production costs at Jordanian industrial firms
- The presence of a positive effect for the adoption of accounting information systems related to the identification of the deviations of production costs as well the efficiency of the accounting information systems and decreasing production costs on the improvement of production costs at Jordanian industrial firms

CONCLUSION

The capacity of the accounting system in relation to decreasing production costs is the most effective factor in the improvement of production costs among Jordanian industrial firms.

RECOMMENDATIONS

- Organizing training courses for the employees in the employment of accounting information systems for raising the efficiency of the individuals who work at this field
- The necessity of establishing a database that is suitable to the requirements of costs for the purposes of improving production costs
- Conducting more research in this field in order to enhance the level of production costs in order to achieve the maximum benefit from the accounting information system
- Conducting future research concerning the evaluation of the role of accounting information systems in improving the internal audit and improving the work of internal auditing committees as well as exploring the effecting using accounting information systems in order to enhance the quality of the commodities of the industrial firms

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