

The effectiveness of accounting information systems in Jordanian private higher education institutions

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Accepted: April 04, 2014

DOI: 10.5296/ijafr.v4i1.5323

URL: <http://dx.doi.org/10.5296/ijafr.v4i1.5323>

Abstract

This study aimed to explore the factors that affecting the accounting information systems in Jordanian private higher education institutions. In doing so, this study distributed 94 questionnaires, only 54 questionnaires were returned. The results showed that the human resources, hardware, software, and data bases have a positive significant relationship with efficiency of AIS. More studies are needed to explore other factors that affecting accounting information systems efficiency since the R^2 of current study is 63.8% which means there are 36.2% of factors did not explored yet.

Keywords: AIS, HR Competency, Software, Hardware, Databases Efficiency

1. Introduction

The growing in universities and educational institutions in world and Jordan particularly creates a need to develop an effective accounting information system that helps in data archiving, analyzing, and classifying to be ready use database. This study aims to shed a light on the factors that enhance the effectiveness of AIS in Jordanian private educational institutions. Due to rapid technological changes there is a need to efficient information systems to organize and develop the institutions. Information technology and information systems play a vital role in supporting the activities of the institutions by providing these institutions by economic information and that will help them in decision making, that make administration able to cope with problems of competitiveness and increasing technological developments.

System can be defined as a group (two or more) of interrelated elements , which interact with each other in order to achieve a particular goal , often composed systems from smaller systems, each function perform a specific task , and support the large system (Haddad , Atma 2009) . Hussein (2005) defined system as coherent and homogeneous resources and elements (i.e. people, equipment, machines, money, and records) that interact with each other within the framework of a certain (system) and operate as a single unit to achieve goal or set of goals.

2. Questions of the study

In light of technological changes and increased interest in the educational process and the output of higher education, there is a need for effective information system due to the major role it plays in achieving the goals of the organization. So this study came to identify the most important factors that influence the effectiveness of accounting information systems by trying to answer the following questions:

- 1- Is there a relationship between human resources competency and AIS efficiency?
- 2- Is there a relationship between the quality of software and hardware and AIS efficiency?
- 3- Is there a relationship between quality of databases and AIS efficiency?

3. Objective of the study

- 1- This study aims at:
- 2- Exploring the efficiency of AIS in Jordanian private educational institutions.
- 3- Examining the influence of software and hardware on the AIS efficiency in Jordanian private educational institutions.
- 4- Examining the influence of database efficiency on the AIS efficiency in Jordanian private educational institutions.

4. Significance of the study

The human resources competency plays an important role in the success of the organization to achieve competitive advantage. Whereas human resources are competent, the organization will achieve outstanding performance. The importance of this study lies in expanding the literature on this area. Previous studies examined the effectiveness of accounting information systems in the banking and industrial sectors, while this study explored the private educational institutions. That will be helpful for the stakeholder, and Software developers to meet the AIS efficiency requirements.

5. Literature review

There are many researchers who have explored factors that affect accounting information systems efficiency (i.e. Shaheen 2012, Haddad and Atmeh (2009), Qatawneh (2005), Hakim (2007)). For example, Shaheen (2012) examined the factors that affect the level of efficiency and effectiveness of accounting information systems in Palestinian commercial banks. He distributed 120 questionnaires to a sample consisting of departments of accounting, auditing, information systems, and computer employees in twelve banks. Only 103 questionnaires were returned revealing 85.6%. The results showed that there are correlations between the environmental, legal, technological and cultural factors and AIS efficiency. However, the impact of these variables varies sometimes, depending on the level of support received from banks administrations.

Haddad and Atmeh (2009) studied factors that affect the role of accounting information system in decision-making strategy in Jordanian industrial companies. In particular, factors relating to information technology and environment. In doing so, the researchers distributed 114 questionnaires to CEOs, Financial Managers, Production and Marketing managers. They used statistical analysis such as t-test, Spearman correlation, R square to test the study's hypotheses. The results revealed that there are positive relationships between information technology, environment, and accounting information system but did not find a relationship between accounting information system and strategic decision-making.

Hakim (2007) explored the impact of using databases on accounting information systems controlling in the public sector. He aimed to identify weaknesses in controlling function in the system analysis stage. He found that using databases in designing accounting information systems and operations enhances accounting information systems' controlling. Qatawneh (2005) studied the impact of using information technology on accounting information system's effectiveness of Jordanian listed banks and insurance companies. He designed two questionnaires to explore perceptions of 13 banks and 10 insurance companies' managers. First questionnaire is to explore perceptions on the effectiveness of the accounting system, and the second one to measure the impact of information technology on the effectiveness of the information system of accounting. The researcher distributed 138 questionnaires; only 113 were returned revealing 82% response rate. He found that using information technology affects positively the effectiveness of information system of accounting especially in banking sector.

(Haddad , Atma 2009) defined the elements of accounting information systems as follows

- 1 - People who operate the system, and perform various functions.
- 2 - The procedures and instructions
 - 3 - Data.
 - 4 - Software.
 - 5 - The infrastructure of information technology, which includes computers, and networks.
 - 6 - Internal control and security that protect the data in the information system.

Hafnawi(2001) stated that the accounting information system has to possess the following characteristics to be effective and efficient:

1. Accurate.
2. Timely.
3. Provide administration by necessary information to achieve control and evaluation of the economic activities.
 4. Provide administration by necessary information that helps them in planning.
 5. Provide administration by feedback
6. Flexible to suit the environmental changes.

Qasim (2004) argued that the accounting information systems should have many functions such as:

- 1 –Collecting and storing the activities and operations data efficiently and effectively.
- 2 –Classifying and summarizing the data.
- 3 –Generating useful information for decision-making.
- 4 – Providing adequate supervision

Aldlahma(2008) explained the elements of accounting information systems; he stated that the accounting information system has seven elements.

- 1- Entity (Economic Unity)
- 2- Documents
- 3- Books and records :(journal and ledger)
- 4- Using double-entry method
- 5- Control systems, which aim to protect the assets and propertyof the entity.
- 6- Qualified human resources.

7- Machines and Equipment.

5.1. Factors that affect the efficiency and effectiveness of accounting information systems:

There are many factors that affecting the efficiency and effectiveness of accounting information systems such as qualified human resources, software and hardware and data bases (Ramly, 2011). Thus, the accounting information systems combined from these three factors, if any system has to be effective it should include a combination of well qualified human resources, the best software, and hardware and data bases.

The process of evaluating level of efficiency and effectiveness of accounting information system in private higher education institutions is determined by the extent of goals achieved by optimal institutions' resources' using. While Efficiency defined as the optimal use of available resources in order to achieve value added in the organization (Avolio, Gilder, and Shleifer 2001) value chain, thus the efficiency means the achievement of the goals at the lowest possible cost (Abdullah and Qattani 2007). While other of researchers such as Hassani and Kharabsheh (2000) defined effectiveness as the relationship between achieved goals and planned goals. In other words, it could be quantified as a ratio to show the effectiveness of an entity.

The accounting information systems in private educational institutions must be able to handle the huge data stream among all departments; also it should be able to process the data and make it available information to the different users timely (Meeda, 2009), (Fadel, 2007).

In Jordan, the most accounting systems used in private educational institutions is an oracle based systems which were used for the first time in Jerash University in 1990. This kind of systems aim to provide information for four groups

- 1 - Admission (students)
- 2 - human resources (staff, lecturers and administrators)
- 3 - Financial Management
- 4 - Accounting department at private educational institutions

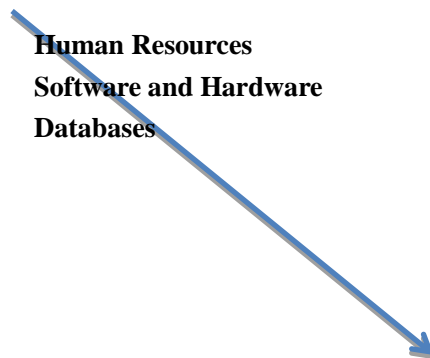
This system also makes information available timely between all departments such as admission and financial department,

6. Population and sample:

The study population consists of two private educational institutions in Jordan; the researcher distributed 94 questionnaires to top- management and academics in these private educational institutions. Only 54 questionnaires were returned revealing 57% response rate.

7. Framework of the study

Independent Variables



Independent Variables



8. Hypotheses of the study

This study has three hypotheses that were devolved based on the abovementioned framework.

First hypothesis

There is a positive relationship between human resources efficiency and accounting information systems efficiency.

Second hypothesis

There is a positive relationship between software and hardware efficiency and accounting information systems efficiency.

Third hypothesis

There is a positive relationship between databases efficiency and accounting information systems efficiency.

To test the aforementioned hypotheses, the researchers developed a questionnaire that distributed to workers at two private educational institutions. The results came as follows:

9. SAMPLE CHARACTERISTICS

The population of this study is 94 workers at two Jordanian private educational institutions. Out of 94 questionnaires distributed, only 58 were returned. Two of these questionnaires were excluded because they were invalid since some of them were incomplete or all answers were marked as "agree." Also, two responses were deleted after normality test was run. The

remaining 54 questionnaires yielded 57.4% responses rate. Table 1.1 exhibited the demographic profile of the respondents.

Table 1.1

Demographic Profile of External Auditors

Category	Frequency	Percentage (%)
Education		
Diploma	2	3.7%
Bachelor degree	11	20.4%
Master degree	19	35.2%
PhD	22	40.7%
Total	54	100%
Specialization		
Accounting	8	14.8%
AIS	18	33.4%
MIS	26	48.1%
CS	2	3.7%
Total	54	100%
Years of Experience		
2 or less	8	14.8%
3 to 5	23	42.6%
6 to 10	17	31.5%
More than 10	6	11.1%
Total	54	100%

Table 1.1 shows that 40.7 % of the sample held a PhD degree. Those with a master's degree were only 35.2 %, and the remaining either had diploma 3.7% or Bachelor degree 20.4%. Regarding the specialization, the majority of the respondents majored in MIS 48.1%, 33.4% in AIS, 14.8% majored in accounting, while only 3.7% majored in computer science. In relation to experience, Table 1.1 shows that 42.6% of the sample had three to five years of work experience, and 31.5% had experience between six and ten years, and the others either had two years or less years of experience 14.8%, or more than 10 years of experience 11.1 %.

10. Goodness of Data

Before testing the research hypotheses, it is important that the data collected were checked for validity and reliability. The content validity of the instrument was ascertained by obtaining expert opinions from six lecturers in Jordanian universities. The construct validity of each variable, on the other hand, was ascertained by running factor analysis, which is elaborated below.

10.1 Factor Analysis

Factor analysis is a type of data reduction technique used to reduce the variables to smaller number factors (Tabachnick&Fidell, 2007). Before performing the factor analysis, the assumptions of normality, homoscedasticity, and linearity were checked (Hair, Black, Babin, Anderson, & Latham, 2010). In line with that, this study used Kaiser Meyer Olkin (KMO) measure of sampling adequacy, which indicates the inter-correlation among the variables and the validity of the variables to enter factor analysis. Bartlett's test of sphericity is needed to test the intercorrelation among the items. For this test, the significance level of less than 0.05 is required to perform the factor analysis. Table 1.2 below shows the guide to interpret findings of factor analysis (Kaiser, 1970, 1974).

Table 1.2

KMO Test Guide

KMO	Opportunity for factor analysis
.90 to 1.00	Marvelous
.80 to .89	Meritorious
.70 to .79	Middling
.60 to .69	Mediocre
.50 to .59	Miserable
Below .50	Should be excluded

According to Hair et al. (2010), the suggested cut-off point for significance loading is 0.4 or above for a sample of 94 subjects. In addition, all components with eigenvalue more than 1.0 will be retained. KMO was used to test the questionnaire validity and to ensure the suitability of all variables entering the factor analysis test, as explained below. The suitability of all items for factor analysis test was assessed by three ways: (1) the correlation matrix includes many coefficients of 0.3 and above, (2) the Kaiser Meyer Olkin (KMO) for all items must exceed the recommended value of 0.6, and (3) the Bartlett's Test of Sphericity (BTS) is significant for all variables. The number of factors was defined by two steps: (1) the factors with eigenvalue greater than 1.0. (2) The factors have substantial amounts of common variance as displayed in the scree test. The variables with no significant loading on the factor were deleted, and then the factor was labeled based on the higher loading variables because they have greater influence than the variables with low loading (Hair et al., 2010).

10.1.1 Human Resources Efficiency

Factor analysis was suitable to be performed on human resources efficiency because the KMO was 0.701 and the sphericity test was significant at $\leq .005$. The items that loaded into human resources efficiency factor explained 46.61 % of the total variance. The loading on this factor ranges from 0.762 to 0.453. This factor consists of seven items describing information about human resources efficiency. Moreover, the outputs in the component matrix were strongly loaded only on one component, and it shows a very clean result. Only one question was removed

10.1.2 Software and hardware efficiency

The KMO test is 0.721 and this exceeds the recommended value of 0.6 and above. The Bartlett's Test of Sphericity was also statistically significant, suggesting that factor analysis was suitable to be performed on this variable.

The loading on this factor ranges from 0.851 to 0.695. This factor includes six items describing information about software and hardware efficiency. Two items were removed because they were not loaded clearly on the components obtained. However, other components matrix had very clean results and were strongly loaded only on one component.

10.1.3 Data bases efficiency

Factor analysis was suitable to be performed on databases efficiency since the KMO was 0.711 and the sphericity test was significant at $\leq .005$. The items that loaded into data base efficiency explained 56.369 % of the total variance.

This factor includes eight items describing information about databases efficiency. Loading on this factor ranges from 0.821 to .684. One item was removed because it was not loaded clearly on the components obtained. However, other components matrix had very clean results and were strongly loaded only on one component.

10.1.4 Accounting information systems efficiency

Factor analysis was suitable to be performed on this variable since the KMO test was 0.806

and the sphericity test was significant at $\leq .005$. The items that loaded into this factor explained 51.954% of the total variance.

Loading on this factor ranges from 0.725 to 0.608. This factor includes ten items describing information about accounting information systems efficiency. Three items were removed because they were not loaded clearly on the components. However, other components matrix had very clean results and were strongly loaded only on one component.

10.2 Reliability of Measurement

After running factor analysis, it is necessary to rerun reliability test again to check for the reliability of the survey instrument. According to Hair et al. (2010), the perfect measure of a concept needs more than one item. Moreover, according to Nunnally (1978), to assess the reliability of the survey instrument, the inter-item analysis can be used to test the scale's internal consistency. Hence, Cronbach's alpha is considered an adequate indicator of the internal consistency and the reliability of the survey instrument (Sekaran&Bougie, 2010). The test shows that the Cronbach's alphas range from 0.808 to 0.759, which exceed the minimum value of 0.7 to be acceptable. This means that the instruments used to measure the variable were acceptable and the data were later used for further analyses (Sekaran&Bougie, 2010).

10.3 Criterion Validity

Criterion validity analysis was conducted by using the dependent variables (Human resources efficiency, software and hardware efficiency, databases efficiency,) and the independent variable (Accounting information systems efficiency). Pearson correlation was used to quantify the strength of relationship between two variables. According to Hair et al. (2010), there is a high collinearity between two variables when the correlation is above 90 percent. So, any correlation that is significant at 0.01 level expresses a 99 percent certainty that the correlation between two variables is not random, and the same applies for significance level of 0.05 which expresses a 95 percent of certainty.

To test collinearity, this study depends on the tolerance (TOL), and the variance inflation factor (VIF). The TOL indicates the effect of the other independent variables on the standard error of regression coefficient. The high VIF value indicates to a high degree of collinearity or multi-collinearity among the variables. Vice versa, the low TOL value indicates to a high degree of collinearity or multi-collinearity among the variables (Tabachnick&Fidell, 2007). According to Hair et al. (2010), the tolerance (TOL) should be above 0.10 and the variance inflation factor (VIF) should be less than 10 to indicate no collinearity or multi-collinearity among the independent variables. As shown in Table 1.3 there is no collinearity or multi-collinearity among the variables of this study. Table 1.3 shows that the values of VIF ranged from 1.693 to 1.943 and the values of TOL range from 0.499 to 0.652.

Table 1.3

Multicollinearity Diagnoses of dependent and independent variables

selbairaV	eloTrance	FIV
Human resources efficiency	.499	1.752
software and hardware efficiency	.510	1.693
data bases efficiency	.501	1.533
Accounting information systems efficiency	.652	1.943

10.4 Linearity, Normality, And Homoscedasticity

Linearity, normality, and homoscedasticity are other important assumptions that should be checked before regression test is performed. The need for normally distributed data is because the correlation represents a linear association between the variables while the nonlinear association is not represented. So the scatter plots should express the normal line for the independent and dependent variables. According to Hair et al. (2010), testing the normality of the data can be done by exploring skewness and kurtosis ratio. Normality is assumed when the skewness and the kurtosis are between ± 1.96 at alpha value .05 and ± 2.58 at alpha .01, respectively. The test depict that the values of skewness and kurtosis and indicate that the data were normally distributed for the current study.

10.5 Correlation Analysis

Hair, Black, Babin, Anderson & Latham(2010) indicated that correlation describes the strength and importance of non-random relationship between two variables. This study uses bivariate correlation and computes Pearson's correlation coefficient with their significance levels. The strength of relationship ranges from -1.00 to 1.00. A correlation value of 0.00 indicates no relationship between the variables while the value of 1.00 indicates a perfect positive relationship. The negative value of 1.00 indicates a perfect negative relationship. Cohen (1988) classifies the strength of relationship according to correlation coefficients, as shown in Table 1.4.

Table 1.4

Guides of Cohen's Correlation Strength

r value	Strength of relationship
r = +/- .10 to +/- .29	Weak
r = +/- .30 to +/- .49	Medium
r = +/- .50 to +/- 1.0	Strong

Table 1.4 demonstrates the correlations between independent and dependent variables of the study, (i.e. Human resources competency, software and hardware efficiency, data bases efficiency,) and the independent variable (Accounting information systems efficiency).

Table 1.5

Correlation between dependent and independent variables

	AIS	HR	SH
HR	.821(*)		
SH	.786(*)	.766(*)	
DB	.651(*)	.595(*)	.411(*)

Note. *Significant at 0.01 (two tailed); ** Significant at 0.05 (two tailed); ***Significant at 0.10 (two tailed); AIS = Accounting information system; HR = Human Resources Competency; SH = Software and Hardware efficiency; DB = data bases efficiency

Table 1.5 shows the strength and the direction of the relationship between the independent variables and dependent variable. There is a strong and positive relationship between AIS value and HR, SH, and DB at the 0.01 level, while there is a moderate and positive relationship between Software and hardware efficacy and the data base efficiency at the 0.01 level. There also is a strong relationship between human resources efficiency, software and hardware efficiency and data base efficiency at the level 0.01

Hypotheses testing

After the assumptions of multiple regression were met, this study proceed to test the relationship between Accounting information system as dependent variable and human resources competency, software and hardware efficiency, and databases efficiency as

independent variables. The results came as shown in table 1.6

Table 1.6

Model Summary

Variable	Coefficient	Significance level
AIS	3.888	.005**
HR	3.902	.004**
S&H	1.786	.033*
DB	2.102	.044*
Constant	2.33	.003**

Note. ** Significant at the 0.01 level (2-tailed); * Significant at the 0.05 level (2-tailed)

Where: AIS= Accounting information system, HR= Human Resources, S&H = Software and Hardware, DB = Data Bases.

Results of Multiple regression between Accounting information system, Human Resources, Software and Hardware, Databases are exhibited in Table 1.6. where R^2 of 0.638 (sig. = 0.000) show that the model explains 63.8% of the variation in Accounting information efficiency and it is significant at the 0.001 level.

Moreover, the result of multiple regression shows that the human resources efficiency (HR) is significantly and positively related to Accounting information system efficiency at level 0.05. This means that companies with well qualified human resources will have more efficient accounting information system. Additionally, companies with efficient software and hardware will have efficient accounting information system. Similarly, companies with efficient databases will have efficient accounting information systems.

11. Conclusions

The result of the current study came in line with past studies such as Ramly (2011), Qatawneh (2005), Hakim (2007), Shaheen (2012), Haddad and atme (2009). For example, Ramly, (2011), argued that the accounting information systems that combined from qualified human resources, software and hardware and data bases will be efficient information system. Also Shaheen (2012) revealed that there is a correlation between the environmental, legal, technological and cultural factors and AIS efficiency. Similarly, Haddad and atme (2009) found that there are positive relationship between information technology, environment, and accounting information system. Thus, entities have to focus on these important three factors

to have an efficient information system.

The R^2 of current study is .638, this means that the current study explain only 63.8% of factors that affecting the efficiency of accounting information systems. Which means there are 36.2% of variables that affecting accounting information systems efficiency did not examined by the current study. This provides an opportunity for researchers to explore additional variables and use different methodologies such as using secondary data which will provide an overview on the current status of accounting information system in Jordan.

References

- Abdullah, K., & Qattani, K. (2007). The effect of baking environment on accounting information systems efficiency. *Jordanian Journal for Applied Science*, 10(1), 18-39.
- Aldlahma, S. (2008). *Basics of Accounting information systems and information technology*. Amman Alwarraq.
- Avolio, G., Gilder, E., & Shleifer, A. (2001). Technology Information production, and Market Efficiency. Retrieved from <http://www.kc.frb.org/publicut/sympos/2001/paper/shleifer.paper.814pdf>
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). New Jersey Lawrence Erlbaum Associates.
- Fadel, A. (2007). The effect of environmental, behavioral, and technological on accounting information system at Yemenis Banks. . Unpublished Mater thesis. AL alByat University
- Haddad, & Atmeh. (2009). *Accounting information system* (1st ed.). Amman: Al Mareekh.
- Hakim, S. (2007). The effect of using data bases to control accounting information systems. Unpublished Master thesis Damascus University
- Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Latham, R. (2010). *Multivariate data analysis* (7th ed.). New Jersey: Pearson.
- Hafnawi, M. (2001). *Accounting information system* (1st ed.): Dar Wael
- Hassani and Kharabsheh. (2000). Requirements of financial controlling departments on performance controlling *Administrative Sciences Journal* 27(2), 34-56.
- Hussein, A. A. (2005). *Accounting information system, Conceptual Framework and applied systems* (1st ed.). Amman: AddarAjameyya.
- Kaiser, H. F. (1970). A second generation little jiffy. *Psychometrika*, 35(4), 401-415.
- Kaiser, H. F. (1974). An index of factorial simplicity. *Psychometrika*, 39(1), 31-36.
- Meeda, E. (2009). Factors affecting accounting system and its role in strategic decision-making. *Damascus University Journal for economic and legal studies*, 25(1), 1-16.
- Nunnally, J. C. (1978). *Psychometric theory* (2nd ed.). New York: McGraw-Hill

- Qasim, A. (2004). *Accounting information system* (1st Ed.). Amman: Dar Althaqafa
- Qatawneh, A. (2005). The effect of using information technology of accounting information system efficiency. Unpublished PhD thesis. Arab Academy for finance and banking
- Ramly, F. (2011). Computerized Accounting information systems. *Decision-making* 16(1), 12-31.
- Sekaran, U., & Bougie, R. (2010). *Research methodology for business: A skill building approach* (5th ed.). Australia: Wiley & Sons.
- Shaheen, A. (2012). Factors affecting accounting information system efficiency Islamic University Gaza.
- Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate analysis* (5th ed.). USA: Parson.