Journal of System Management (JSM)
Online ISSN: 2538-1571
Print ISSN: 2322-2301
6(3), Fall 2020, pp. 237-263
Research Paper

The Effects of Information System Integration on Financial Performance Mediated by Cost Performance and Quality Performance: An SEM-based Analysis

Mostafa Sadeghnia [1] **Mohammad Hosein Setayesh** [2]

Abstract **This study investigated the effects of information system (IS) integration on financial performance in Tehran Stock Exchange with an emphasis on the mediating role of cost performance and quality performance. This survey was carried out in 2018 by distributing 300 questionnaires among all CEOs, financial administrative vice-presidents, accounting managers, and accountants of manufacturing companies listed in the Tehran Stock Exchange. A total of 250 questionnaires were returned, and the data were analyzed in SmartPLS using structural equation modeling (SEM).The results confirmed the significant positive relationships of flexibility, completeness, and knowledge sharing with IS integration. In addition, IS integration affected corporate financial performance both directly and through the mediating variables of cost performance and quality performance. In other words, any increase in each of these three variables led to an improvement in corporate financial performance.**

Keywords *Cost Performance; Quality Performance; Financial Performance; Accounting Information System (AIS)*

Received: 11/07/2020 Accepted: 14/12/2020

[1] Department of Accounting, International Division, Shiraz University, Shiraz, Iran
[2] Department of Accounting, School of Economics, Management and Social Sciences, Shiraz University, Shiraz, Iran. Corresponding Author, Email: setayesh@shirazu.ac.ir

Introduction

Accounting is an information system and managers need to obtain quality information from all formal and informal channels in order to make better decisions. The development of information technology (IT) and creation of accounting information system (AIS) are key elements in removing time and space constraints, accessing information quickly, and being up to date. In other words, the development of computerized AISs and software packages by reputable companies has transformed the way things are done and has changed paper-based platforms into electronic platforms. Scholars in the past did not pay much attention to the importance of information; however, today, it is considered the second most important resource for managers after human resources (Sajjadi and Tabatabaei Nejad, 2006).Successful IT integration can provide IT resources to support employees better perform their new roles and functions (Rockart *et al.*, 2008). From a social and organizational perspective, companies with high levels of IT integration across their performance channels may be able to send, combine, and process external data obtained from customers and suppliers. Moreover, external information is easily exchanged and acquired in these companies. In addition, internal and external systems automatically reflect changes (Barua, Konana, Whinston, & Yin, 2004), Sikora and Shaw, 1998), and help monitor order at different levels during production.IT facilitates internal partnerships to promote the integration of internal (supplier) and external (customer) activities, as well as to improve decisions made by supply chain members. Previous studies suggest that higher degrees of IT integration lead to greater profitability (Simoens and Scott, 2005). Internal IS integration refers to the electronic IT communications of companies that facilitate timely and accurate exchange of various information (Hummer, 2001). External IS integration refers to the standardization and digitization of inter-organizational information exchange

process (Zhou and Benton, 2007).In response to various pressures, organizations have become increasingly competitive (Stenzel, 2004). Cost performance and quality performance have become dimensions for determining degrees of competitiveness (Drury, 2000). Quality performance refers to internal quality and evaluates a firm's capability in producing products that conform to their design quality; therefore, it calculates the overall costs of internal errors (Dawson and Patrickson, 1991). Corporate profitability involves conventional indicators of financial performance (Maiga and Jacobs, 2004). On the other hand, IS integration helps companies identify, mobilize, and coordinate necessary resources to enhance different capabilities, and reduce overall costs (Wong *et al.*, 2014).Studies in Iran have not addressed management accounting systems in detail, and have not investigated the overall effect of several components on corporate financial performance. In this study, the research literature was reviewed, the necessary data were collected, and the relationship between IS integration and financial performance was investigated. This study aimed to address the following research questions: Does IS integration affects the financial performance of the companies listed in the Tehran Stock Exchange? Do cost performance and quality performance mediate the relationship between IS integration and financial performance? To this end, the authors present the theoretical research foundations, develop a conceptual model, propose and test the research hypotheses, and present the final results in the following sections.

Literature Review

Accounting information system (AIS) is a corporate element that provides users with necessary decision-making information by processing financial events and information. This system can be regarded as the rational intersection of two broader issues, namely accounting and management

information system (MIS). Both these fields focus on information; however, accounting mainly focuses on information itself, while MIS tends to focus on covering systems that generate information (Rahnamay Roodposhti *et al.*, 2013).An integrated information system includes several integrated computerized and manual components designed to collect, process, control, and store information, ensure the accuracy of information flow within the organization, facilitate operational functions, and provide management with information support in critical decisions. Companies mainly focus on IS integration when implementing an information system. Integration has some direct or indirect effects on organizational components; therefore, successful IS integration only takes place within the context of organizational processes integration (Gulledge, 2006). On the other hand, technology revolution and information explosion have forced scholars to rethink the logic of classic business. As a result, organizations, companies, and institutions experience a wide range of strategic choices and organizational structures. Current business models are rooted in industrial economy; therefore, there are ambiguities about their relevance to today's needs. Some scholars express their opinions in the context of knowledge-based organization; others propose a transition to a service-oriented, intelligence-focused economy. Some focus on core competencies and recommend authorities to design organizations in a way to better leverage competencies; others support the development of flexible and small organizations (McGrann, 2002).People rely on multiple information sources when beginning to make a decision; therefore, given the increasing speed of information production, they need to develop a MIS to refine, compress, store, and transmit all these information. The accounting information system, as part of this system, records and summarizes financial events. This system faces many theoretical and practical issues and complexities in the process of supporting the decision-making process within

the domain of "IS integration". These problems and complexities are rooted in the nature of information systems. These systems have a sociotechnical nature (Ropohl, 1999), and can be considered as complex adaptive (Holland, 2006), or viable (Beer, 1984) systems. In addition, these systems can be studied using systems thinking approach (Senge, 2003) and complexity theory (McMillan, 2004). The integration of these complex systems is a complicated, multifaceted issue. Therefore, it is impossible to study and identify these systems at the absence of a coherent problem-recognition system (Nemati Shamsabad and Moeini, 2015).Flexibility is among fundamental features of an organization's IT infrastructure. According to Davenport (1998), IT infrastructure flexibility is a special capability. IT infrastructure must also be capable of adapting to new market conditions. It is designed and built by man, and includes interconnected and integrated communications, computers, software, and data that enable effortless, quick access to any information (Rockart *et al.*, 1996).Information system flexibility is divided into two categories of flexibility-to-use and flexibility-to-change. Flexibility-to-use refers to a range of process requirements that can be fulfilled without requiring major changes in the IS. On the other hand, flexibility-to-change refers to the degree to which a system can be changed in future by experts (Gebauer and Schober, 2006). This can be promoted through an integrated IS provided that users are allowed to make necessary corrections to data (Chapman and Kihn, 2009).Namdarian and Elahi (2004) argue that flexibility is an important component of information integration, and believe that flexibility helps organizations enhance information transparency, acquire sustainable competitive advantages, and improve customer services. Bhatt and Troutt (2005) believe that IS integration involves data integration, network development, and network flexibility, which can have significant effects on service improvement and customer responsiveness.

According to the stated cases, the first hypothesis of the research is:

H_1: There is a significant relationship between "IS flexibility" and "IS integration".

The design of different parts of integrated information systems requires the interaction of various specialties including informatics, industrial engineering, accounting, and system science; however, professional computer companies and integrated IS designers have not so far paid serious attention to this issue. Most software projects are designed and carried out based on the experience of informatics specialists, and in some cases, with regard to user guidance and recommendations. Considering the inadequate knowledge of informatics specialists about accounting and financial issues and other necessary knowledge, as well as the inadequate knowledge of users about relevant design methods and integration techniques, the implemented systems are poorly designed and built.In most cases, specialists do not pay adequate attention to the relationships between various systems when designing and implementing an integrated IS in organizations. They also do not carefully study the information capabilities of the systems. In this case, the process of implementation of integrated information systems will be similar to that of production of software packages without the realization of necessary cooperation between different workgroups. This approach often results in costly and time-consuming reworks and may even compromise the prominent feature of integrated information systems (Taheri, 2006).Information systems contain information about important people, places, and issues within the organization or its surrounding environment. Information systems are more than just a computer; effective use of information systems requires a clear understanding of the organization, management, and information technology forming the system (Sun and Laden, 2004). In other words, completeness is a

fundamental component in the process of integration accounting information systems.

According to the stated cases, the second hypothesis of the research is:

H_2: There is a significant relationship between "IS completeness" and "IS integration".

In terms of compatibility, the interaction between information system specialists and managers is necessary, because information systems are constantly evolving and their characteristics are changing (Sarlak and Farati, 2013). The acquisition of a thorough knowledge of technologies, processes, and staff is a good driver for improving organizational performance. In addition, an IS group must be able to actively collaborate with other groups. Today, managers and management accountants increasingly depend on IS groups for technical supports and occasional changes in information systems. This interaction can be implemented through shared knowledge, which is defined as a common understanding of IS experts and managers about technologies and processes affecting the performance of both parties (Henttonen *et al.*, 2016). Information systems are vital components in the design and implementation of many new technologies. In addition, these systems connect businesses, and as a valuable achievement of the information age, they have deeply penetrated into human life and social systems to facilitate the proper flow of information. Nowadays, knowledge workers, users, and managers need to implement information systems to integrate, create, and share information and knowledge in order to make and announce timely decisions. In fact, organizations must establish and maintain strong relationships with knowledge sharing bases to solve problems related to data definitions and structures, diverse and integrated database designs, *etc.* (Pardo and Tayi, 2007).According to the stated cases, the third hypothesis of the research is:

H_3: There is a significant relationship between "IS knowledge sharing" and "IS integration".

The performance of all accounting information systems is examined prior to their implementation using cost-benefit analysis. IS cost performance refers to their ability to deliver the highest expected performance at the lowest possible cost. This definition is entirely consistent with the cost leadership strategy. The development of different cost leadership strategies by companies leads to the adoption of different cost approaches. In cost leadership strategy, companies try to offer their products or services at a lower price than their competitors. They seek to reduce overall costs by increasing efficiency in production or distribution processes or lowering public and administrative costs. However, prominent product features and main competitive advantages should be maintained to retain customers (Balucher *et al.*, 2010). Therefore, successful implementation of this strategy depends on corporate cost performance and on whether companies can generate continued profit by providing cheaper products or not.Organizations use one or all available cost advantage resources to become low-cost producers in industry. Outstanding organizations manage to implement and maintain cost leadership strategy. Cost leadership is achieved in many ways including mass production and distribution, economies of scale, technology, product design, resource optimization, and access to raw materials (Allen and Helms, 2006). Extensive use of cost leadership strategy is appropriate when economies of scale and scope are important and achievable, and when it is difficult to differentiate the product (Salaman and Asch, 2003).The cost performance index (CPI) is a measure of earned value management (EVM) that reflects cost efficiency. If the CPI value is larger than 1, then the cost performance is acceptable, and values smaller than 1 indicate poor performance. Normally, the obtained value should never be negative. CPI values do not tend to move towards the value

of 1 when the task is completed; thus, optimal management decisions can help in these cases. A CPI of 1.1 means a dollar and ten cents worth of work has been completed for every dollar spent; in other words, the contractor has achieved 110% cost efficiency. Accordingly, a CPI of 0.95 means only 95 cents worth of work has been completed for every dollar spent, or the contractor has achieved 95% cost efficiency (Ghiasi *et al.*, 2013).Accounting information constitutes a major part of information required by managers to make decisions. Manager use accounting information to make economic decisions, and choose strategies that can maximize profits and minimize costs. Considering that accounting measures economic information and provides users with necessary information to make informed decisions through information systems, and given the importance of various reports derived from accounting information systems, managers need to effectively use quality information provided in these systems (Hollander *et al.*, 1999).High IS quality performance ensures that the organization is adopting appropriate strategies leading to the fulfillment of objectives. The performance level of an organization is a function of efficiency and effectiveness of its operations; therefore, quality performance measurement is indeed the quantification of an organization's efficiency and effectiveness. The performance measurement results show what has happened (Sink, 1991).Maiga *et al.* (2015) investigated the relationships of internal and external IS integration and cost and quality performance with firm profitability, and found that internal IS integration has a significant relationship with external IS integration. In addition, internal and external IS integration had strong relationships with cost performance and quality performance. Quality performance was significantly correlated with cost performance, and finally, quality and cost performance had significant relationships with corporate profitability.According to the stated cases, the fourth and fifth hypotheses of the study are:

H_4:4. There is a significant relationship between "IS integration" and "cost performance".
H_5: There is a significant relationship between "IS integration" and "quality performance".

Financial performance of companies is among major concerns of shareholders and managers of economic units. Using new methods, managers try to better manage their organizations and deliver superior performance. Many factors affect corporate financial performance, and companies use a set of efficient and effective approaches to improve their business processes (Lee and Kim, 2006).There are two main approaches to performance measurement: objective and subjective. These approaches have their own advantages and disadvantages (Allen *et al.*, 2008). Objective scales are more realistic; however, they are limited to financial data and do not explain organizational dimensions. On the other hand, subjective scales are less realistic, but they provide a rich description of organizational effectiveness. These scales enable us to compare a wide range of organizations across industries; thus, findings provided by subjective scales are more generalizable. Subjective scales also include the perception-based analysis elements that are widely used in social sciences. However, organizational orientations and management attitudes determine which performance measurement approach must be chosen (Rahnavard, 2008).Financial approaches were traditionally adopted in the past to measure organizational performance. Today, these approaches are no longer effective, because financial measures were complementary to the machinelike nature of organizations and former management philosophies (Niven, 2002). Today, financial performance scales have improved and the concept of economic value added is of great importance. According to this concept, a company cannot create value for its stakeholders unless its profit exceeds its cost of capital. Accordingly, Dess and Robinson (1984) state that

performance variables include quality, productivity, profitability, market share, return on investment, and overall performance. In addition, new approaches to corporate performance measurement emphasize the role of organizational vision and strategies in defining performance measures. For example, the balanced scorecard approach uses performance measurement as a new language to describe key elements in achieving organizational strategy in both public and private sectors (Rahnavard, 2008).Fayard et al. (2012) in a study entitled "effect of internal cost management, information system integration, and absorptive capacity on inter-organizational cost management in supply chains" concluded that internal and external IS integration directly affects performance quality and cost, which in turn both affect corporate profitability. They also found that internal and external IS integration increases the production of high-quality products at lower costs.According to the stated cases, the sixth to tenth hypothesis of the study is:

H_6: There is a significant relationship between "IS integration" and "corporate financial performance".

H_7: There is a significant relationship between "IS cost performance" and "corporate financial performance".

H_8: There is a significant relationship between "IS quality performance" and "corporate financial performance".

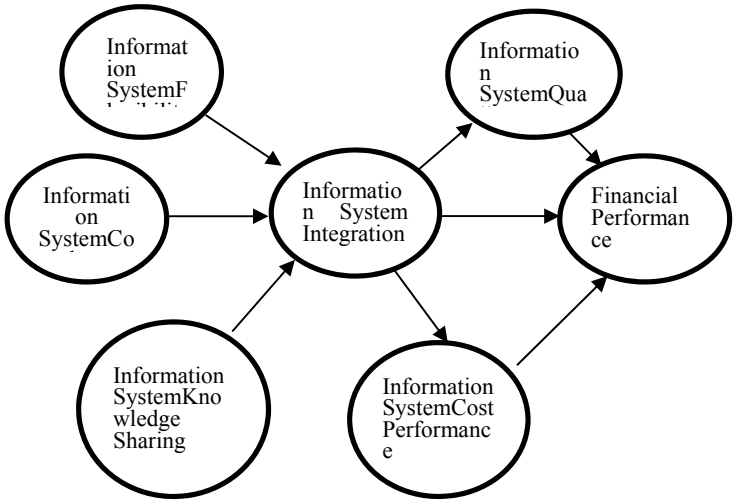
H_9:"IS cost performance" mediates the relationship between "IS integration" and "corporate financial performance".

H_{10}:"IS quality performance" mediates the relationship between "IS integration" and "corporate financial performance".

The following conceptual model is designed for the present research with regard to the aforementioned theoretical foundations:

Figure 1

The Research Model



Research Methodology

In this applied survey, the data were collected using the desk study (documentary; *i.e.* the study of relevant journals, books, reputable scientific sites and corporate financial statements) and survey (questionnaire) methods. The data were not normally distributed; therefore, they were analyzed in SmartPLS. The study population consisted of all financial managers, CEOs, and accounting staff of manufacturing companies listed in the Tehran Stock Exchange in 2018. A minimum sample size of 200 (or 15 samples per latent variable) is suggested (Hooman, 2012). A total of 300 questionnaires were randomly distributed among the members of the study population, of which 250 questionnaires were completed and received.An 11-item questionnaire designed by Stuart (2010) was used to measure IS integration, and the items

were scored on a five-point Likert scale.IS flexibility refers to the availability of various hardware, software and scientific infrastructures required for making changes to information systems in response to new needs or environmental conditions in order to effectively meet current business needs. To measure this variable, three questions were selected from a questionnaire designed by Ogan (2016).IS Completeness refers to the inclusion of the information needed and used by all corporate units and departments in the information system, on a single database (Chapman and Kihn, 2009). Ogan's questionnaire (2016) was used to measure this variable.Sharing involves the exchange of information between corporate IT, financial, and operational managers to improve the efficiency and effectiveness of the AIS. Given that information systems are constantly changing and evolving, this exchange of information within organizations is essential (Ogan, 2016). This variable was also measured using four questions from Ogan's questionnaire.The questionnaire of Lobo and Zaire (1999) was used to measure cost and quality performance. This scale includes two dimensions of cost performance (four criteria) and quality performance (four items), and the items are scored on a five-point Likert scale. In addition, as a separate item, budgeted cost of work performed was divided by actual cost of work performed in order to measure CPI.Performance measurement indicators can be divided into accounting and economic categories. Accounting indicators use accounting data to measure a firm's performance, whereas economic indicators measure a firm's performance with respect to its earning power and investment potentials using measures such as rate of return and cost of capital. Accounting indicators are also divided into two categories. The first category is based on accounting information and the second one is based on market information. The accounting information-based indicators mainly measure financial performance using information presented in basic financial statements and

notes to financial statements. Examples include return on assets (ROA), return on equity (ROE), and price-to-earnings (P/E) ratio. Relevant data on these indicators were extracted from financial statements of manufacturing companies listed in the Tehran Stock Exchange using Rahavard Novin Software.

Findings

Reliability is measured by calculating factor loadings, Cronbach's alpha coefficients, and composite reliability. A factor loading of 0.4 is considered suitable, because it indicates that the variance between a construct and its indicators exceeds its measurement error variance, and therefore, the reliability is acceptable (Holland, 1999). The results showed that all the indicators had suitable factor loadings.Based on the common data analysis algorithm in PLS method, composite reliability values of the research constructs should be calculated in the next step. Cronbach's alpha is a relatively old-fashioned measure for determining reliability; thus, the PLS method uses a more modern measure called composite reliability. Values greater than 0.7 indicate suitable reliability of the model. The obtained values for all the research constructs were above 0.7 indicating suitable reliability of the model.

Table 1

Composite Reliability Values

Latent Variable	Composite Reliability (Alpha >0.7)
Cost performance	0.899
Financial performance	0.797
IS flexibility	0.907
IS integration	0.922
IS knowledge sharing	0.898
Quality performance	0.860
IS completeness	0.819

Convergent validity examines the degree to which each construct is related to its respective measures. In SmartPLS, the average variance extracted (AVE) is used to measure convergent validity and its acceptable value is above 0.5.

Table 2

Average Variance Extracted (AVE) of Latent Variables

Latent Variable	AVE (AVE >0.5)
Cost performance	0.750
Financial performance	0.570
IS flexibility	0.585
IS integration	0.523
IS knowledge sharing	0.687
Quality performance	0.607
IS completeness	0.604

Discriminant validity measures the correlation of a construct with its measures against its correlation with other constructs. Fornell and Larcker (1981) proposed the use of a matrix for measuring discriminant validity. According to them, in each latent variable, the square root of each AVE along the main diagonal should be larger than its correlation with the lower left off-diagonal elements.

Table 3

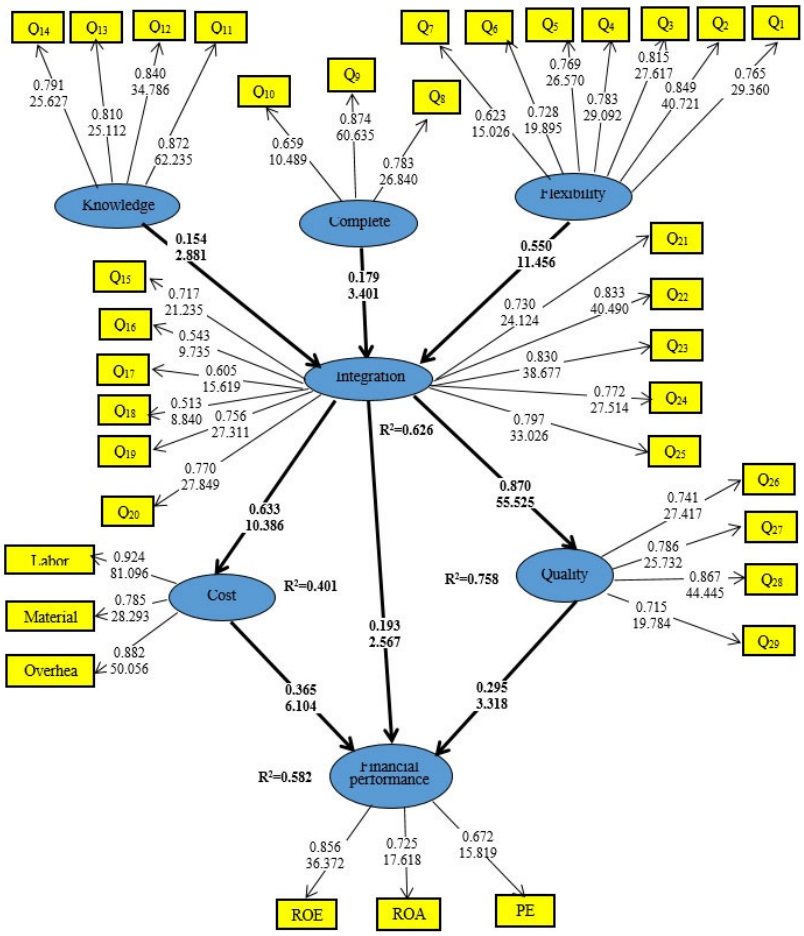
Fornell and Larcker Matrix

Constructs	Cost performance	Financial performance	IS flexibility	IS integration	IS Knowledge sharing	Quality performance	IS completeness
Cost performance	0.866						
Financial performance	0.674	0.755					
IS flexibility	0.470	0.529	0.765				
IS integration	0.633	0.681	0.763	0.723			
IS knowledge sharing	0.397	0.442	0.677	0.635	0.829		
Quality performance	0.635	0.694	0.692	0.670	0.549	0.779	
IS completeness	0.386	0.530	0.613	0.609	0.610	0.532	0.777

According to the above table, the correlations between the research constructs (latent variables) and their respective measures are stronger than their correlations with other constructs; therefore, the discriminant validity of the model is acceptable.The first and most important measure of goodness of fit of the research model include z coefficients or t-values. If the sample size is larger than 120, values greater than 1.96 are considered significant at a 95% confidence level, and those greater than 2.66 are significant at a 1% confidence level. As shown in Figure 2, the path coefficients of all latent variables are greater than 1.96, indicating the significance of the paths and the suitability of the structural model.

Figure 2

Coefficient of Determination (R^2) Values and z Coefficients



Coefficient of determination (R^2) of the endogenous research variable was the second measure of goodness of fit in this study. R2 shows the effect

of an exogenous variable on an endogenous variable, and R2 values of 0.19, 0.33, and 0.67 indicate weak, moderate, and strong levels of determination, respectively (Mohsenin and Esfidani, 2014: 150). As shown in Figure 2, R2 values of 0.582, 0.758, 0.401, and 0.626 were obtained for the constructs of financial performance, quality performance, cost performance, and IS integration, respectively. All these values indicate that the structural model fits the data well. It should be noted that this coefficient is not calculated for exogenous variables.This criterion determines the predictive power of the research model. In this research, the Q^2 values of 0.304, 0.315, 0.328, and 0.452 were obtained for the endogenous constructs of cost performance, financial performance, IS integration, and quality performance, respectively indicating great predictive power and suitable goodness of fit of the model.

Table 4
Q^2 Values

Total	SSO	SSE	1-SSE/SSO
Cost performance	750	521.761112	0.304319
Financial performance	2750	513.965216	0.314713
IS integration	2750	1848.091835	0.327967
Quality performance	1000	547.948750	0.452051

In addition, based on the model output shown in Figure 2, the value of $\overline{R^2}$ is 0. 592. Therefore, the goodness of fit (GOF) value is calculated using the following formula:

$$GOF = \sqrt{\overline{Communalities} \times \overline{R^2}} = \sqrt{0.618 \times 0.592} = 0.605$$

And considering that values of 0.01, 0.25, and 0.36 are considered as weak, moderate, and strong GOF (Mohsenin and Esfidani, 2014: 73); thus, the obtained GOF value (0.605) indicates the great goodness of fit of the research

model.The research hypotheses can be tested using the common data analysis algorithm for fitted models. To this end, z-values and path coefficients were calculated as summarized in table 5.

Table 5
Research Hypotheses and Results

Hypothesis	Path Coefficient	T-Value Z-Value	Result
H_1: There is a significant relationship between "IS flexibility" and "IS integration".	0.550	11.456	Accept
H_2: There is a significant relationship between "IS completeness" and "IS integration".	0.179	3.401	Accept
H_3: There is a significant relationship between "IS knowledge sharing" and "IS integration".	0.154	2.881	Accept
H_4: There is a significant relationship between "IS integration" and "cost performance".	0.633	10.386	Accept
H_5: There is a significant relationship between "IS integration" and "quality performance".	0.870	55.525	Accept
H_6: There is a significant relationship between "IS integration" and "corporate financial performance".	0.193	2.567	Accept
H_7: There is a significant relationship between "IS cost performance" and "corporate financial performance".	0.385	6.104	Accept
H_8: There is a significant relationship between "IS quality performance" and "corporate financial performance".	0.295	3.318	Accept
H_9: "IS cost performance" mediates the relationship between "IS integration" and "corporate financial performance".	0.244	5.873 (Sobel Test)	Accept
H_{10}: "IS quality performance" mediates the relationship between "IS integration" and "corporate financial performance".	0.257	3.312 (Sobel Test)	Accept

Variance accounted for (VAF) is a statistic used to measure the effect size of mediating variables. Its value ranges between 0 and 1, and the closer it is

to 1, the stronger the effect of the mediating variable will be. In fact, this value measures the proportion of the indirect effect to the total effect. VAF is calculated as 0.26 for the path of the independent variable of "IS integration", the mediating variable of "cost performance" and the dependent variable of "financial performance":

$$VAF = \frac{a \times b}{(a \times b) + c} = \frac{0.633 \times 0.385}{(0.633 \times 0.385) + (0.870 \times 0.295) + 0.193} = 0.26$$

VAF is also calculated as0.26 for the path of the independent variable of "IS integration", the mediating variable of "quality performance" and the dependent variable of "financial performance":

$$VAF = \frac{a \times b}{(a \times b) + c} = \frac{0.870 \times 0.295}{(0.633 \times 0.385) + (0.870 \times 0.295) + 0.193} = 0.27$$

Table 6

Direct and Indirect Effects of Research Variables

Path	Direct Effect	Indirect Effect	Total Effect
IS integration→ Cost performance	0.633	-	0.633
IS integration→ Quality performance	0.870	-	0.870
IS integration→ Financial performance	0.193	0.53[2]	0.723
Cost performance → Financial performance	0.385	-	0.385
Quality performance → Financial performance	0.295	-	0.295

According to Table 6, there are significant positive relationships between components of information systems (including flexibility, completeness, and knowledge sharing) with IS integration.

[2]0.26+.027

Discussion and Conclusions

Based on the first hypothesis, there is a significant relationship between flexibility and IS integration. At the process stage, flexibility enables companies to better integrate with AIS, easily adapt to the evolving and changing external environments, and achieve and maintain higher performance levels. These findings are in line with the findings of Namdarian and Elahi (2004), Ghorbanizadeh *et al.* (2014), Davenport (1998), and Bhatt and Trout (2005).The second hypothesis results showed that there is a significant relationship between completeness and IS integration. Information systems have numerous capabilities such as performing fast, heavy numerical processes, providing fast, accurate and inexpensive communication, enhancing inter-employee collaboration, promoting employee effectiveness and productivity, *etc.* However, to gain such organizational benefits, companies have to integrate their information systems. These results are consistent with those of Taheri (2006), Sun and Laden (2004), and Maiga *et al.* (2013).According to the third hypothesis, there is a significant relationship between knowledge sharing and IS integration. In other words, the exchange of knowledge between managers and experts greatly affects the evolution, implementation, and integration of information systems. Technical supports and necessary changes in information systems increase the need for greater interaction through shared knowledge, which is defined as a common understanding of IS experts and managers about technologies and processes affecting the performance of both parties. The results of this hypothesis are in line with those of Sarlak and Farati (2013), and Henttonen *et al.* (2016).The results of the fourth and fifth hypotheses confirmed the significant effects of IS integration on cost performance and quality performance. In other terms, IS integration leads to higher cost efficiency, and helps companies become low-cost producers. On the other hand, High IS quality performance ensures

that companies are adopting appropriate strategies leading to the fulfillment of their objectives. These results are in line with the studies of Hollander *et al.* (1999), Allen and Helms (2016), and Maiga *et al.* (2013).Based on the sixth hypothesis, the implementation of IS integration with an emphasis on today's needs improves financial performance by eliminating extra costs, increasing the volume and speed of information production, and increasing efficiency and accuracy rates at various stages of the accounting cycle (including gathering, recording, summarizing, and reporting information). These are in line with the findings of Fayard *et al.* (2012) and Maiga *et al.* (2013).The results also showed that the mediating variables of "quality performance" and "cost performance" directly and indirectly (outputs of Table 9) account for about two-thirds of the total effect of IS integration on financial performance. This indicates that companies are adopting a new accounting approach, which involves "strategic cost management" and aims to create cost control systems within organizations. In today's business environment, the development of cost control systems has become a vital skill for many companies to survive and improve their financial performance. In this regard, traditional cost reduction techniques are not effective, because costs must be strategically controlled and managed. Accordingly, the better the cost control systems are managed, the greater the financial performance and profitability of companies will be. The results of the seventh to tenth hypotheses are in line with those of Fayard *et al.* (2012) and Maiga *et al.* (2013).

Research limitations

Considering the use of questionnaire for collecting the data, some respondents may have given unrealistic responses to some questions. In addition, scientific and academic institutions and other professional bodies have failed to provide people with appropriate training on the concept and

applications of integrated information systems; therefore, many participants were slightly familiar with these systems and their implementation in their companies.

References

Abedi Jafari. H, Asadnejad Rokni. M, Yazdani. H R, (2011). "Exploring the Effect of Using Information Technology on Functional and Strategic Performances of the Human Resource Management Units in Automaker and Automotive Supplier Companies in Tehran", Journal ofInformation Technology Management, No. 9, pp. 69-88.

Ali-Nejad. M, Pourkarim. E, (2011). "The Impact of Accounting Information Systems on the Performance of SMEs", National New Ideas in Accounting and Auditing Conference, Islamic Azad University Isfahan (Khorasgan) Branch.

Allen, R. and G. W. Dawson "K. and White, CS (2008). Perceived Diversity and Organizational and correlates." Journal of Employee Relations 30(1): 20-33.

Allen, R. S. and M. M. Helms (2006). "Linking strategic practices and organizational performance to Porter's generic strategies." Business Process Management Journal 12(4): 433-454.

Barua, A., Konana, P., Whinston, A. B., & Yin, F. (2004). Assessing Internet enabled business value: An exploratory investigation. MIS Quarterly, 28(4), 585-620.

Beer, S. (1984). "The viable system model: Its provenance, development, methodology and pathology."the operational research society 35(1): 7-25.

Bhatt, G. D, Troutt. M (2005). Examining the relationship between business process improvement initiatives, information systems integration and customer focus: an empirical study, Business Process Management Journal, Vol. 11 No. 5, pp. 532-558

Blocher, E., et al. (2010). "Cost Management: A Strategic Emphasis . 1221 Avenue of the Americas." New York, NY 10020.

Chapman, C. S. and L.-A. Kihn (2009). "Information system integration, enabling control and performance." Accounting, Organizations and Society 34(2): 151-169.

Chapman, C. S. and L.-A. Kihn (2009). "Information system integration, enabling

control and performance." Accounting, Organizations and Society 34(2): 151-169.

Dastgir. M, Ghalebi. R, (2010). "Evaluation of qualitative features of Accounting Information", Financial Accounting, 2(5), 17-38.

Davenport, T. H. (1998). "Putting the enterprise into the enterprise system." Harvard business review, 76(4).

Dawson, P., & Patrick son, M. (1991). "Total quality management in Australian banking industry." Int. J. Qual. Reliab, Manage 8(5): 66–76.

Dess, G. G., & Robinson, R. B. Jr. (1984). "Measuring organizational performance in the absence of objective measures." Strategic Management Journal 5: 73-265.

Drury, C. G. (2000). "Global quality: linking ergonomics and production." Int. J. Prod. Res. 38(17): 4007–4018.

Fayard, D., Lee, L. S., Leitch, R. A., Kettinger., W. J., (2012). "Effect of internal costman- agement, information systems integration, and absor ptive capacity on inter-organizational cost management in supply chains",Account, Organ, Soc, 37, pp. 168–187.

Gebauer, J., & Schober, F. (2006). "Information system flexibility and the cost efficiency of business processes",Journal of the Association for Information Systems, 7(3), 8.

Ghorbanizadeh. V, Bazyar. A, Ashrafi-Golshan. H, Motazedian. R, (2014). "The Role of Integration of Information System in Acquiring Competition Advantage", Journal of Information Technology Management Studies, Vol., No. 7, pp. 83-107.

Gulledge, T. (2006). "What is integration?. Industrial Management & Data Systems."

Hammer, M. (2001). "The supper efficient company."Harv, Bus, Rev: 82–91.

Henttonen, K., Kianto, A., & Ritala, P. (2016). "Knowledge sharing and individual work performance: An empirical study of a public sector organization, Journal of Knowledge Management, 20(4): 749-768.

Hooman. H A.(2012). "Structural Equation Modeling with LISREL Application", SAMT Publication, Fifth Edition.

HoIIander, A. S., Denna, E. L., & Cherrington, J. O. (1999). "Accounting information Technohogy and the Business Sloution." Volume 6 Advances in Accounting

Information Systems.
Holland, J. H. (2006). "Studying Complex Adaptive Systems." Journal of Systems Science and Complexity, 19 (2): 1-8.
Ingrid lobo, Mohamed zair. (1999). "competitive benchmaking in the air cargo industry: part ll." benchmarking an international journal 6(3): 220-238.
Jafaei. B, Nazarimanesh. L., Hajinabi. K, (2018). "Relationship between Information Technology Capabilities and Responsiveness in Baharloo Hospital of Tehran", Journal of Hospital, 17 (2), pp. 97-104.
Kordestani. GH, Hadiloo. A A, (2011). "The Relationship between IT Investment and Financial Performance", The Financial Accounting and Auditing Researches, Vol. 3, No. 10, pp. 163-187.
Lee, S., Kim, S. H. (2006). "A Lag Effect of IT Investment on Firm Performance." Information Resources Management Journal, 19 (1): 43-69.
Maiga, A. S, Nilsson., A, & Jacobs, F. J, (2013). "Extent of managerial IT use, learning routines, and firm performance: a structural equation modeling of their relationship." Int. J. Account. Inf. Syst 14 (4): 297–320.
Maiga, A. S., & Jacobs, F. A. (2004). "Association Between Benchmarking and Organizational Performance: An Empirical Investigation." Managerial Finance 30(8).
Maiga, A. S., Nilsson, A., & Ax, C. (2015). Relationships between internal and external information systems integration, cost and quality performance, and firm profitability. International Journal of Production Economics, 169, 422-434.
McGrann, J. (2002). "Using Financial Information to Improve Ranch Performance." Department Of Agricultural Economocs, Texas and A. M. University.
McMillan, E. (2004). "Complexity, Organizations and Change." rout ledge.
Namdarian. L, Elahi. Sh, (2004). "Developing an Integrated Conceptual Model for Acquiring Competitive Advantage through Information Systems with a Resource-Based Approach", First International Conference on Information and Communication Technology Management.
Nemati Shamsabad. H, Moeini. A, (2015). "Inter-organizational information systems integration: Representing a model for understanding integration problem domain", Journal ofInformation Technology Management, Vol. 7, No. 3, pp.

675-696.

Niven, P. R. (2002). "Balanced Scorecard Step-by-Step: Maximizing Performance and Maintaining Results." New York: John Wiley & Sons, Inc.

Ogan Yigitbasioglu, (2016), "Firms' information system characteristics and management accounting adaptability." International Journal of Accounting & Information Management 24: 1-23.

Pardo, Theresa A. Tayi, Giri Kumar, (2007).“Interorganizational information integration: A key enabler for digital government”, Government Information Quarterly, pp: 691-715

Rahnamay Roodposhti. F, Nikoomaram. H, Mahmoudi. M, (2013). “An assessment effect of management accounting information system based on decision support and business intelligence in stock exchange companies”, Journal of Management Accounting, 32th year, No. 32, pp. 111-122.

Rahnavard.F, (2008). “Factors Enhancing the Performance of Public Organizations”, Journal of Humanities and Social Sciences (Management), 8th year, No. 4 (31), pp. 77-100.

Rockart, J. F., Ear, M. J., & Ross, J. W. (1996). "Eight imperatives for the new IT organization." Sloan Management Review, 38(1): 43–56.

Rockart, J. F., Ear, M. J., Ross, J. W. (1996). “Eight imperatives for the new IT organization”,Sloan Management Review, 38(1), pp. 43–56.

Ropohl, G. (1999). "Philosophy of Socio-Technical Systems." PHIL & TECH, 4 (3), 59-71.

Sajjadi. S H, Tabatabaei Nejad. S M, (2006). “Accounting Information Systems”, Shahid Chamran University Press, First Edition.

Salaman G, Asch D. (2003). "Strategy and capability sustaining organizational change”, United Kingdom, Blackwell Publishing.

Sarlak. M A, Farati. H, (2013). “Advanced Information Management Systems”, Payam-e-Noor Publication.

Senge, P. (2003). "The Fifth Discipline: The Art and Practice of the Learning Organization." Tehran: Industrial Management Organization.

Senn James, Laudon Kenneth, (2003). “Management Information Systems (Applications in Business)”.

Sikora, R., Shaw, M. (1998). "A multi-agent framework for coordination and

integration of information systems." Management Science, 44(11): 65–78.

Simoens, S. Scott., A. (2005). "Integrated primary care organizations: to what extent is integration occurring and why?", Health ServManage, Res18:25-40.

Sink, D. (1991). "The role of measurement in achieving world class quality and productivity management", Industrial Engineering 23: 6.

Stenzel, J, & Stenzel, C, (2004). "Performance measurement and management in the reinsurance industry." Cost Manag 18(3): 28-35.

Stuart M. Redman t. (2010). "The Role of Human Resource Management in information system",development management school .vol 45.

Taheri. A, (2006). "Development of Integrated Systems in Iran", Monthly Journal of Tadbir, No. 177, pp. 28-32.

Vardon, M., Castaneda, J.-P., Nagy, M., & Schanau, S. (2018). "How the System of Environmental-Economic Accounting can improve environmental information systems and data quality for decision making",Environmental science & policy, 89, 83-92.

Zhou, H, Benton., W. C, (2007). "Supply chain practice and information sharing." J. Oper, Manage 25(6): 1348-1365.