The Moderating Effect of the Cloud Computing on the Relationship between Accounting Information Systems on the Firms' Performance in Jordan

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Abstract: - This research explores the relationship between Accounting Information systems (AIS) components, namely, System availability, security and integrity, confidentiality and privacy, and system quality with firm performance in Jordan, alongside the moderating influence of cloud computing. The data was collected in 2021 using a questionnaire from 263 respondents from the firms listed on Amman Stock Exchange that use cloud computing services. The findings revealed a significant relationship between the AIS components and cloud computing with firm performance, except for the system quality. In addition, cloud computing plays a significant moderating role in the relationship between System availability, and security & integrity, with firm performance. This study suggested that the AIS components substantially influence management monitoring, which may affect the firm's effectiveness and lead to better performance. With the use of cloud computing, the firm will gain more as reliable data is always available.

Key-Words: - Accounting Information System, Cloud Computing, Firm Performance, Jordan, SysTrust Framework

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1 Introduction

The shareholders in modern corporations, who ultimately possess the authority, demand from the management the responsibility and make the decisions to protect their interests and provide high performance. In satisfying the shareholders, management guides the firm and uses the firm's resources, such as financial, human, and physical, and includes utilizing information effectively to create value for the firm [1].

In handling the rapidly changing business environment, the management must take care of continual development and monitoring of the information to optimize their performance [2]. Organizations now seek to take advantage of utilizing reliable data to enhance performance. A tool that is considered an effective system with a pivotal role in providing the most crucial internal information source is used. This system shall capture and address the accounting and financial data, offering valuable information for decision-making. In short, this is the function of the Accounting Information System (AIS) in helping the management.

AIS has significant potential to improve the organization's success in the decision-making process. AIS is considered an essential factor in achieving the organizational objectives, which also has a potential influence that may enhance the firm's performance by improving effectiveness in managing information [3]. Many studies concerning firm performance and its factors have been undertaken in developed countries, focusing on modern technologies, particularly the AIS. However, relatively little evidence is provided in this study in the Middle East.

Several studies concerning the firm performance, such as Marashdeh (2014); Aldehayyat et al. (2017); Aktan et al. (2018), and Al Matari and Mgammal (2019), are conducted in the Middle East. These studies are considered beachheads for the modern technologies and the modern practices of the business in the Middle East or North Africa

(MENA) [4]–[7]. Yet, the limitation of these studies is that most of them focused on corporate governance mechanisms. However, a few studies highlighted that further concern should be made on the AIS, internal control, and technology systems [3], [8].

Al Mubaidin (2020) mentioned that the Jordanian government launched its special Cloud Computing platform to provide the Jordanian users with the ability to access the needed online infrastructure, such as servers and software, and at high speed, without the need to purchase servers, domains and software [9]. It is expected that the Jordanian firms will leverage the platform and utilize modern technology to enhance their effectiveness and boost their firm performance. But yet, Gharaibeh and Khaled (2020) studied the Jordanian service sector performance and described the clueless determinants of the firm's performance, which is explained by the inappropriate strategies and poor business plans [10]. In short, it might be a gap between the technology used and the firm performance.

Thus, this study is designed to bridge the gaps by evaluating the effectiveness of using AIS and its relationship with firm performance. Particularly, this study explores the relationship between the AIS components, namely system availability, security and integrity, confidentiality and privacy, and system quality, with the firm performance in Jordan. With the encouragement of the Jordanian government on the use of cloud computing, this study used cloud computing as a moderator that influences the relationship between AIS and firm performance.

2 Literature Review

AIS is often regarded as machines able to transform input into pre-defined output in high volumes. A simplified model of an accounting information system shows the system organised in three levels. At the basic level, there are business processes that produce elementary data regarding simple business operations, collected by the operational accounting system. At the intermediate level, there is the financial accounting system where elementary data are organised, to respond to the financial accounting standards and to produce the financial statements and some other financial information. At the top level, there is the management accounting system where both operational and financial data are processed to produce information and perhaps knowledge to support managerial and strategic decisions [11]–[14]. The use of AIS in companies is not only aimed at accounting for usual tasks, but also at improving management control. Firstly, the architectural model of an accounting information system integrates both financial and management accounting, and secondly links management accounting to management control since management accounting information is used for management control purposes [15].

2.1 System Availability

The first segment of the current study is about the relationship between System Availability of AIS and Firm Performance. System Availability of the system represents the ability of services to be accessible as needed, whenever and wherever they are required [16]. In this segment, the researcher was trying to assess how the availability of the accounting information system in the firm plays an important role in predicting the firm performance, and how the availability of the data and reports can boost the firm performance and help the decision-makers to make the proper decisions. Many studies focused on this relationship and studied the effect of System Availability and Firm Performance. One of the studies was conducted by Olugbode et al. (2018) to implement new integrated business and supporting IT systems by studying the role of the system availability and how it would streamline operations, increase internal efficiency, facilitate sustained growth, and increase firm performance using a case-study approach. The findings of this research illustrated a significant and positive role of system availability on firm performance [17]. Moreover, Ismail and King (2019) conducted a study focused on measuring the System availability of accounting information systems (AIS) and how it affects the firm performance. The researchers found that it is important as only after a firm analysis its accounting information System availability can it have a clear idea of how to invest in new technology or utilise the available technology effectively and improve firm performance [18]. Therefore, it can be hypothesized the following:

H1: There is a positive relationship between the System Availability of AIS and Firm Performance.

2.2 Confidentiality and Privacy

The second segment of the current study is about the relationship between Confidentiality and Privacy of AIS and Firm Performance. Confidentiality and privacy are the preserving authorized restrictions on access and disclosure, including means for protecting personal privacy and proprietary information [19]. In this segment, the researcher investigated how the Security and the Integrity of

the accounting information system in the firm can be important in predicting the firm performance, it discusses how such confidentiality and privacy could help the decision-makers achieve a proper decision and enhance the performance of the firm. Many studies focused on this relationship and studied the effect of the System Confidentiality and Privacy with Firm Performance. With an aim to enhance understanding of the effect of customer data privacy on firm performance, Martin et al. (2017) conducted their study on 414 public companies in several European cities. The researchers, at both firm and customer levels, confirm that data privacy generates negative outcomes for firms, including negative abnormal stock returns and damaging customer behaviours [20]. In addition, this study aims to assess the role of data privacy on the Indonesian firms' performance in light of issuing new data protection bills from the Ministry of Communication and Information. The researchers found that. The researchers found that data privacy played a significant role in the Indonesian firms' performance [21]. Therefore, one can hypothesize the following:

H2: There is a positive relationship between Confidentiality and Privacy with Firm Performance.

2.3 Security and Integrity

The third segment of the current study is about the relationship between Security and Integrity of AIS and Firm Performance. In the world of information technology, security and integrity refer to the accuracy and completeness of data, in addition to the controls designed to prevent data from being modified or misused by an unauthorized party [14]. In this segment, the researcher investigated how the Confidentiality and Privacy of the accounting information system in the firm can be important in predicting the firm performance, it focuses on the role of the security measures followed by firms could improve the firm performance. Many studies focused on this relationship and studied the effect of System Security and Integrity on Firm Performance. Among the studies that targeted this relationship is the study conducted by Gu et al. (2017), which explores the mechanism of how internal and external information system integration with customers and suppliers can eventually enhance firm performance. In this study, it has been reported that integrated internal and external information systems among supply chain partners can strengthen their relationships and improve their firm's operational performance. The findings suggest that strengthened relationship with suppliers will only improve suppliers' operational performance which will positively influence manufacturers' operational performance directly and financial performance indirectly [22]. Moreover, Olugbode et al. (2018) also studied the integrity of IT systems with the growth of firm performance using a case-study approach. The findings of this research showed that a significant and positive role of integrity of IT systems on the firm performance [17]. In addition, Sundram et al. (2020) investigated the role of information technology integration with firm performance in Malaysia. The researchers found that the relationship between information technology integration and firm performance measures [23]. Therefore, the research has hypothesized the following:

H3: There is a positive relationship between the Security and Integrity with Firm Performance.

2.4 System Quality

The fourth segment of the current study is about the relationship between System Quality of AIS and Firm Performance. System Quality reflects quality of the information system processing itself, which contains software and the data components, and it's concerned with whether there are bugs in the system, the consistency of user interface, ease of use and quality of documentation [24]. In this segment, the researcher carried out an analysis in order to figure out how the System Quality of the accounting information system in the firm can be important on predicting the firm performance. Many studies focused on this relationship and studied the effect of the System Quality with Firm Performance. First, Al-Mamary et al. (2018) conducted a study to explain the relationship between system quality and information quality with organizational performance. The researchers found a positive relationship between system quality, information quality with organizational performance [25]. Moreover, Leibert (2019) carried out a study to analyse and compare the system quality of hospitals participating in highly integrated systems with non- integrated hospitals based on outcome measures involving hospital performance. The results of the review demonstrate that there is a statistically significant positive difference between the system quality and hospitals' organizational performance [26]. One could hypothesize the following:

H4 There is a positive relationship between System Quality and Firm Performance.

2.5 Cloud Computing

The Fifth segment of the current study is about the moderating effect of Cloud Computing between the

variables of AIS and Firm Performance. Cloud Computing is the on-demand availability of computer system resources, especially data storage and computing power, and the delivery of computing services, including servers, storage, databases, networking, software, analytics, and intelligence, over the Internet ("the cloud") to offer faster innovation, flexible resources, and economies of scale [27]. Many studies focused on the moderating effect of Cloud Computing. First, Liu et al. (2018) investigated the link between cloud computing and organizational performance based on survey data from users of the Alibaba cloud in China by analysing the moderating effect of IT spending on cloud computing. The researchers suggested that firms must continuously use cloud computing technology and nurture superior firm-wide cloud infrastructure capabilities to successfully utilize information technology resources to establish beneficial operation and customer relations [28]. Moreover, Tarani et al. (2021) documented the difference between adoption factors in cloud-based enterprise in small and medium organisations in Iran and considered the cloud computing as a moderating variable. The results of the field study among 200 Iranian SMEs revealed a significant moderating effect of Cloud Computing, which means that while top management support has the greatest impact on cloud computing, the advantage of the cloud computing has the most impact on cloud CRM adoption. Moreover, technological readiness was identified as the most effective factor in the adoption of cloud ERP among SMEs [29]. Therefore, in respect of the moderating effect of the Cloud Computing, the following hypotheses have been developed to investigate the moderating effect of the cloud computing on the relationship between the components of the accounting information system and firm performance:

H5: There is a positive relationship between Cloud Computing and Firm Performance.

H6: The relationship between the System Availability of AIS and Firm Performance is moderated by Cloud Computing.

H7: The relationship between the Confidentiality and Privacy with Firm Performance is moderated by Cloud Computing.

H8: The relationship between the Security and Integrity with Firm Performance is moderated by Cloud Computing.

H9: The relationship between System Quality and Firm Performance is moderated by Cloud Computing.

2.6 Overview of the Conceptual Framework

The SysTrust service framework is an assurance service that was jointly developed by AICPA and CICA. It is designed to increase the comfort of management, customers, and business partners with systems that support a business or particular activity. According to the AICPA (2013), SysTrust is an assurance service that independently tests and verifies a system's reliability [30]. According to Al-Dmour (2019) a better understanding of the influence of SysTrust principles upon business performance and quality of financial reporting should be viewed as whole rather than isolated fragments. The magnitude and significance of the loading estimate indicate that all of these five principles of SysTrust are relevant in predicating business performance and quality financial reporting [31].

The AICPA succinctly describes the overall purpose of SysTrust in the following way: Developments in information technology provide far greater power to companies at far lower costs. As business dependence on information technology increases, tolerance decreases for systems that are not secure, and these systems become unavailable when needed and unable to produce accurate information on a consistent basis. An unreliable system can cause a chain of events that negatively affect a company and its customers, suppliers, and business partners [32]. This study applies the SysTrust service framework. Overall, this research examines the System Availability, the Security and the Integrity, the Confidentiality and Privacy, and the System Quality to determine Firm financial and non-financial performance among the Jordanian Firms listed on Amman Stock Exchange and uses Cloud computing for their Accounting Information System. In addition, the researcher included Cloud Computing as a Moderating influence in the research model. As such, Figure 1 displays the proposed framework.

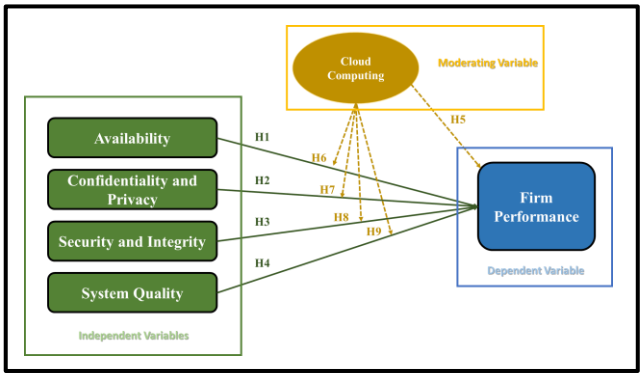

Fig. 1: Conceptual Framework

3 Research Methodology

In this research, the researcher will utilize quantitative research methods. Primary data was collected from employees working for Jordanian firms that use cloud computing services for their Accounting Information Systems and listed on Amman Stock Exchange in the industrial and Service Sector, on which the respondents were selected based on non-probability sampling. According to the records of Amman Stock Exchange (2021), therefore, total of 70 firms were selected [33]. The researcher distributed a total of 350 questionnaires on the staff of these firms, on which 263 out of 350 were returned and fully answered and valid for analysis, which represent a total of 75.1%. From the 263 valid questionnaires, 159 came from the firms that are working in the Services sector (out of 200 questionnaires distributed). The Industrial sector came second with 104 valid questionnaire (out of 150 ones). The results illustrated in Table 1.

Table 1. Response rate

#	Ministry	Questionnaires Distributed	Respondents
1	Services sector	200	159
2	Industrial sector	150	104
Total		350	263

4 Instrument Development

The development of instruments was carefully executed to reflect the nature of this research. As such, the questionnaire was designed to include 36 items, and the variables were measured using the five-point Likert scale, with five standing for 'Strongly Agree' and one standing for 'Strongly Disagree'. Since the participants spoke Arabic, the survey needed to be accurately translated from English to Arabic. As a result, a reverse translation was conducted, which is a common method for determining the accuracy of a translation in a cross-cultural survey [34]. Furthermore, the validated instruments listed in Table 2 were adopted from relevant prior researches to measure the variables in this research.

Table 2. Research Instrument

Construct	No of Items	Adapted	Citation
AIS System Availability	4	AVA1: System availability is periodically reviewed AVA2: Qualified personnel to assure system availability AVA3: Substitute copies for System availability AVA4: Procedures to avoid data loss	[8]
AIS Security & Integrity	6	SNI1: Policies for authorised users SNI2: Periodically reviewed with security policies. SNI3: Communicate IT security policies. SNI4: Perform tests on data integration. SNI5: Established designated staffs SNI6: Procedures in ensuring date accuracy	[8]
AIS Confidentiality & Privacy (CNP)	7	CNP1: System confidentiality is periodically reviewed. CNP2: Policies is published. CNP3: Procedure for breaches CNP4: Privacy policies is well defined. CNP5: Authorization in handling data. CNP7: Data usage policy	[8]
AIS System Quality (SYQ)	6	SYQ1:System is flexible. SYQ2: Regularly monitor. SYQ3: Instructions for useability. SYQ4: System processing speed. SYQ5: Systems security and protection SYQ6: System safety	[35]
AIS Cloud Computing	5	CC1: Assist in conducting the correct procedure. CC2: Helps in a better quality of decisions. CC3: Improves the effectiveness in decision-making CC4: Speeds up the operations CC5: Provides better control over the system function	[36]
Firm Performance	8	Non-financial performance items: PER1: Ability to exploit all its resources to the fullest PER2: The policy of reducing indirect expenditure. PER3: The volume of the company's profits are suitable with the quality of products and the nature of the services provided by customers. PER4: The Company is increasing the wealth of shareholders and achieving real returns on investment. Financial performance items: PER5: The Company's profits distributed to shareholders with their tendencies and expectations. PER6: The Company applies effective methods and policies that increase the amount of future cash flow. PER7: Encourage access to new markets with a view to increasing sales from services provided and increasing return on investment.	[35], [37]

		PER8: The investments of the Regional and International Company offer profits investment targets for the company.	

5 Results and Analysis

The current study has assessed the proposed model in two steps consisting of the assessment of the measurement model (outer model) and the assessment of the structural model (inner model). However, before these two steps, a brief explanation is given regarding the respondents' profiles.

5.1 Respondent Profile

The first segment of the instrument compiled information on background profile of the respondents which comprises of their Gender, Sector, Experience, Organization Age, and System. The characteristics of each demographic profile are described below in Table 3.

Table 3. Respondent Profile (Frequencies)

Construct	Options	Frequency	Percent
Gender	Male	175	66.5
	Female	88	33.5
Sector	Services sector	159	60.5
	Industrial sector	104	39.5
Experience	Less than 5 years	107	40.7
	5 – 9 years	121	46.0
	10- 15 years	26	9.9
	More than 15 years	9	3.4
Organization Age	Less than 5 years	35	13.3
	5 – 9 years	78	29.7
	10- 15 years	115	43.7
	More than 15 years	35	13.3
System	A combination of manual and computer processed	43	16.3
	Completely computerized	220	83.7
	Total	263	100.0

5.2 Measurement Model

The research model of this study was tested using SmartPLS 3.3. In addition, an examination was conducted regarding the measurement model (validity and reliability of the measures). As a result, Cloud Computing (CC) scored a low value of Cronbach's Alpha (0.666). This value is below the cutoff point for Cronbach's Alpha (0.7), as recommended by Hair et al. (2017). In addition, not all of the constructs in the first run recorded AVE values higher than 0.5 for each group of data [38], as the lowest AVE value reported is for Firm Performance (PER) (0.429), followed by Confidentiality and Privacy (CNP) (0.438), Cloud Computing (CC) (0.503), System Quality (SYQ) (0.520), System Availability (AVA) (0.615) and Security and Integrity (SNI) (0.660). Furthermore, CNP1, CC1, CC5, PER4 and PER8 scored low factor loadings (-0.100, -0.238, -0.221, 0.364, and 0.145 respectively) which all were below the recommended level of 0.4 by Ramayah et al. (2018). Therefore, a form of modification was considered in the second run and, consequently, CNP1, PER4 and PER8 were deleted to achieve satisfactory levels of Cronbach's Alpha, AVE and factor loadings [39]. Overall, all variables have achieved the cut-off point, as illustrated in Table 4 (see the results also in Figure 2).

Table 4. Convergent Validity Results

Construct	Item	Factor Loading	Cronbach's Alpha	CR	AVE
System Availability (AVA)	AVA1	.761	.795	.865	.617
	AVA2	.808			
	AVA3	.830			
	AVA4	.738			
Confidentiality and Privacy (CNP)	CNP2	.691	.807	.860	.509
	CNP3	.727			
	CNP4	.823			
	CNP5	.754			
	CNP6	.618			
	CNP7	.649			
Security and Integrity (SNI)	SNI1	.715	.896	.920	.659
	SNI2	.768			
	SNI3	.849			
	SNI4	.843			
	SNI5	.848			
	SNI6	.839			
System Quality (SYQ)	SYQ1	.790	.815	.866	.521
	SYQ2	.817			
	SYQ3	.703			
	SYQ4	.606			
	SYQ5	.660			
	SYQ6	.732			
Cloud Computing (CC)	CC2	.894	.889	.931	.818
	CC3	.917			
	CC4	.903			
Firm Performance (PER)	Non-financial		.840	.880	.550
	PER1	.654			
	PER2	.809			
	PER3	.760			
	Financial				
	PER5	.717			

	PER6	.760			
	PER7	.741			

(*) CNP1, CC1, CC5, PER4 and PER8 were deleted due to low factor loading, Cronbach's Alpha, and AVE, as follows:

- CNP AVE was 0.438 before deleting CNP1 (factor loading -0.100)
- CC Cronbach's Alpha was 0.666 before deleting both of CC1 (factor loading -0.238) and CC5 (factor loading -0.221)
- PER AVE was 0.429before deleting both of PER4 (factor loading 0.364) and PER8 (factor loading 0.145)

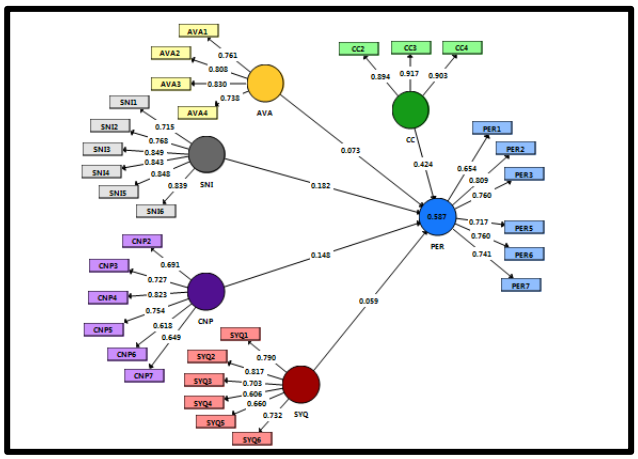

Fig. 2: PLS algorithms results

Secondly, the discriminant validity was examined to assess how truly distinct a construct is from other constructs. In the area of distinguishing validity, the correlations between variables. The estimation of the model did not exceed 0.95, as suggested by Kline (2016) [40], and the validity was tested based on measurements of the square root of the average variance calculated for a construct and the correlations between constructs [40], [41]. Hence, Table 5 contains the results of the Fornell and Larcker Criterion and shows no value above the recommended cutoff point of 0.95 [41].

Table 5. Fornell and Larcker Criterion

	AVA	CC	CNP	PER	SNI	SYQ
AVA	.785					
CC	.404	.905				
CNP	.410	.617	.713			
PER	.417	.726	.597	.742		
SNI	.445	.762	.656	.679	.812	
SYQ	.523	.720	.648	.634	.749	.722

Moreover, the Heterotrait-Monotrait ratio (HTMT) is a calculation that estimates the actual correlation between two constructs if they were properly assessed (i.e., if they were perfectly reliable) [38], [42]. Furthermore, HTMT is the average of all correlations of indicators across constructs measuring different constructs (i.e., HTMT correlations) compared to the (geometric) mean of the average correlations of indicators measuring the same construct (i.e., HTMT correlations) and can be used to assess discriminant validity, on which Gold et al. (2001) recommended the accepted level of HTMT to be below 0.90. As such, the accepted level of HTMT is 0.90 can be seen in Table 6.

Table 6. HTMT Criterion

	AVA	CC	CNP	PER	SNI	SYQ
AVA						
CC	.466					
CNP	.479	.705				
PER	.464	.806	.675			
SNI	.522	.853	.755	.744		
SYQ	.666	.834	.751	.710	.859	

5.3 Structural Model

The path model's theoretical or conceptual aspect is represented by the structural model. The structural model, also known as the inner model in PLS-SEM, contains the latent variables and their path relations [38]. The next step after the evaluation of the measurement model is to assess the structural model. In sync with PLS-SEM, there are five steps required to assess the structural model according to Hair et al. (2017) including the assessment of collinearity (step one), assessment of the path coefficients (step two), coefficient of determination (R2 value) (step three), blindfolding and predictive relevance Q2 (step four), and effect size f2 (step five) [38].

Table 7 illustrates the results of PLS bootstrapping consisting of the Beta value, t-values, p-values, hypothesis results (whether supported or not) BCILL, BCIUL, f2, and VIF scores. Furthermore, Figure 3 summarizes the results of the structural model and PLS bootstrapping.

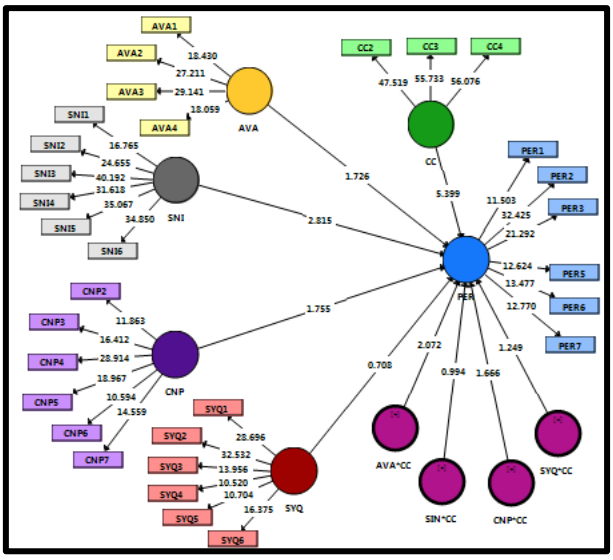

Fig. 3: PLS Bootstrapping Results

Table 7. PLS bootstrapping results

Hypothesis		Std. Beta	Std. Error	T values	P values	Decision	Confidence Intervals		f^2	Effect size	VIF	R^2	Q^2
							Lower	Upper					
H1	AVA -> PER	.088	.051	1.726	P<.05 (.042)	Supported	.010	.177	.026	Weak	1.398	.587	.292
H2	CNP -> PER	.119	.064	1.755	P<.05 (.033)	Supported	.003	.215	.035	Weak	2.005		
H3	SNI -> PER	.202	.072	2.815	P<.05 (.003)	Supported	.078	.317	.253	Medium	3.172		
H4	SYQ -> PER	.058	.082	0.708	P>.05 (.240)	Rejected	-.076	.198	.003	No effect	2.99		
H5	CC -> PER	.386	.072	5.399	P<.001 (.000)	Supported	.272	.513	.389	Substantial	2.776		
H6	AVA*CC -> PER	.140	.067	2.072	P<.05 (.019)	Supported	-.271	-.046	.019	Medium	1.008	.600	
H7	CNP*CC -> PER	.161	.097	1.666	P>.05 (.048)	Supported	-.288	.019	.014	Weak	1.006		
H8	SIN*CC -> PER	.094	.095	0.994	P>.05 (.160)	Rejected	-.054	.263	.005	No effect	2.033		
H9	SYQ*CC -> PER	.130	.104	1.249	P>.05 (.106)	Rejected	-.067	.280	.011	No effect	2.232		
*** P<0.001, ** P<0.01, * P<0.05													

5.3.1 Assessment of the Structural Model for Collinearity Issues

The first step in the structural model is to assess collinearity issues. It is vital to safeguard against collinearity issues between the constructs before performing a latent variable analysis in the structural model. As such, the collinearity has been measured by measuring the VIF value. The threshold value for the assessment is 3.3, following the recommendation of Diamantopoulos and Siguaw (2006) [43]. In this study, as illustrated in Table 7, all inner VIF values for the constructs are within the range of 1.006 to 3.172. All are less than 3.3, thus indicating that collinearity is not a concern in this study.

5.3.2 Assessing the Significance of the Structural Model Relationships

The bootstrapping approach was used to provide data for each path relationship in the model to evaluate the hypotheses, as shown in Table 7.

In PLS, bootstrapping is a nonparametric test that involves repeated random sampling with replacement from the original sample to generate a boot-strap sample and achieve standard errors for hypothesis testing [38]. Chin (2010) recommended bootstrapping with 1000 samples when it came to the number of resampling [44]. Nine hypotheses for the constructions have been developed in this study. T-statistics for all pathways were computed using the bootstrapping tool in SmartPLS 3.3 to assess the significance level. A significance level of 0.05, a two-tailed test, and 1000 subsamples was used in the bootstrapping. For the two-tailed test, the critical value for the significance level of 5% ($\alpha = 0.05$) is 1.645 [39].

The value of the path coefficients has a standardized value between -1 and +1, according to the data in Table 7. (Values from 0.14 to 0.485). Estimated route coefficients approaching +1 indicate strong positive associations, according to Hair et al., (2017), and the closer the number comes to zero, the weaker the relationships get. In the next step, toward conducting the T-test, relationships are found to have T-values of more than or equal to 1.645. Therefore, these relationships are significant at 0.05 for H1 ($\beta = 0.088$, $t = 1.726$, p-value = 0.042), H2 ($\beta = 0.119$, $t = 1.755$, p-value = 0.033), H3 ($\beta = 0.202$, $t = 2.815$, p-value = 0.003), H5 ($\beta = 0.386$, $t = 5.399$, p-value = 0.000). While H4 ($\beta = 0.058$, $t = 0.708$, p-value = 0.240) will be rejected. A summary of these findings is illustrated in Table 7.

5.3.3 The Coefficient of Determination (R^2)

The next stage is to evaluate the model's predictive accuracy through the derived value of the coefficient of determination (R^2). The value of R^2 is linked to the model's predictive power and ranges from zero to one, with a higher value indicating a higher level of predictive accuracy [38]. Using the SmartPLS algorithm, the value of R^2 has been calculated as shown in Table 7.

Furthermore, Hair et al. (2017) detailed 3 different levels of R^2 scores. If R^2 is above 0.75 it will be considered as substantial, if R^2 is above 0.50 it will be considered as moderate, and if R^2 is above 0.25 it will be considered as weak, while if R^2 below 0.25 it will be considered as unacceptable. As per Table 8, the scores of R2 for PER are considered as in Moderate level as recommended by Hair et al. (2017).

Table 8. The coefficient of determination (R2)

Construct	R^2
PER	.587

On the whole, the R^2 values found in this study are extremely similar to those reported in a majority of extant works of research in the corresponding literature. For instance, in a study conducted by Akpoviroro et al. (2018), the R^2 value reported is 0.511 from which it can be concluded that the model can predict up to 51.1 percent of the factors influencing employee performance [45]. This percentage is deemed to be satisfactory in the context of a social science study.

5.3.4 Assessment of the effect size (f^2)

In this stage, the effect sizes (f^2) have been evaluated. The value of f2 is connected to the relative impact of a predictor construct on endogenous constructs. According to Sullivan and Feinn (2012), aside from reporting the p-value, both the substantive significance (effect size) and statistical significance (p-value) are crucial to be reported [46]. Furthermore, to measure the effect size, a guideline set by Cohen (1988) has been followed [47]. Based on the study of Cohen (1988), the values of 0.02, 0.15, and 0.35 represent small, medium, and large effects respectively [47]. As it can be viewed in Table 7, H4 has f^2 values less than .02 which indicated no effect at all, H1 and H2 have f^2 values more than .35 which indicated weak of effect, H3 has f^2 values more than .15 which indicated medium size of effect, and H5 has f^2 values more than .35 which indicated substantial of effect.

5.3.5 Assessment of the Predictive Relevance (Q^2)

As the final step, the predictive relevance of the model has been assessed through the blindfolding procedure, as suggested by Hair et al. (2017) [38], Table 9 provides the Q^2 value (along with the R^2 values) of all the endogenous constructs. The Q^2 value was above zero and therefore supported the model's predictive relevance regarding the endogenous latent variables as recommended by Stone (1974), Geisser (1974) and Hair et al. (2017). Finally, there was no issue associated with a single-indicator construct as a predictor construct in this study [38], [48], [49].

Table 9. The Predictive Relevance (Q2)

Construct	Q^2
PER	.292

5.3.6 Assessment of Moderation Analysis

After testing the direct effect, the moderation hypothesis is tested. A moderator is characterized as a third construct that can change or affect the relationship between the independent and dependent variables [38], [50]. This study used continuous types of data as the moderation, and the analysis is conducted using the SmartPLS 3.3.

The moderation assessment follows the Orthogonalizing Approach (Henseler & Chine, 2010). This approach builds on the indicators approach and requires creating all product indicators of the interaction terms [39] (see Table 10).

Table 10. square change

R^2 included moderator	R^2 excluded moderator
.587	.600

The first step is to create the interaction effect between the two indicators of Firm Performance (PER) and Cloud Computing (CC). As shown in Table 10, The R^2 for the main model (without the interaction) is 0.587, and with the interaction effect model, the R^2 is 0.600. The R^2 change about 0.013 (additional variance). Next, the effect size is calculated using the following formula:

(1) f^2 = (R^2 included moderator – R^2 excluded moderator) / (1 - R2 included moderator)

$f^2 = (0.600 - 0.587) / (1 - 0.600)$

$f^2 = 0.033$

Based on the guideline by Kenny (2018), 0.005, 0.01 and 0.025 respectively show the standards for small, medium, and large effects sizes. Therefore, based on the value of 0.033, it can be concluded that the effect size is large [51]. Although the beta coefficient for the interactions of AVA*CC and CNP*CC are 0.140 and .161 respectively (Refer to Table 7) with p-value of 0.019 and 0.048 respectively. While, the beta coefficient for the interactions of SIN*CC and SYQ*CC are 0.094 and .130 respectively (Refer to Table 7) with p-value of 0.160 and 0.106 respectively. Therefore, to obtain the significant of the relationship, the bootstrapping procedures are conducted. From Table 11 below, the interactions term of AVA*CC (t= 2.072) and CNP*CC (t= 1.666) are significant, for the one-tailed test with a significant level of 0.05. Therefore, it can be concluded that the hypothesis H6 and H7 are Supported. While, the interactions term of AVA*CC (t= 0.994) and CNP*CC (t= 1.249) are insignificant, for the one-tailed test with a significant level of 0.05. Therefore, it can be concluded that the hypothesis H8 and H9 are Rejected.

Table 11. Moderation Model Assessment

Hypothesis		Std. Beta	Std. Error	T values	f^2 (For the moderation)	VIF	P values	Decision
H6	AVA*CC -> PER	-.140	.067	2.072	.033	1.008	P<.05 (.019)	Supported
H7	CNP*CC -> PER	-.161	.097	1.666		1.006	P>.05 (.048)	Supported
H8	SIN*CC -> PER	.094	.095	0.994		2.033	P>.05 (.160)	Rejected
H9	SYQ*CC -> PER	.130	.104	1.249		2.232	P>.05 (.106)	Rejected

Next, as suggested by Dawson (2014), to further elaborate the moderating phenomenon of Cloud Computing (CC), the pattern of the interaction effect is plotted to see how the moderator changes the relationship between System Availability (AVA), Confidentiality and Privacy (CNP), Security and Integrity (SNI), System Quality (SYQ) and Performance (PER) [50]. Figure 4 highlights on the lines of interactions that denotes the presence of the moderation effect of Cloud Computing (CC) on the relationships between System Availability (AVA), and Confidentiality and Privacy (CNP) with Performance (PER), while it denotes as well the absence of the moderation effect of Cloud Computing (CC) on the relationships between Security and Integrity (SNI), and System Quality (SYQ) with Performance (PER).

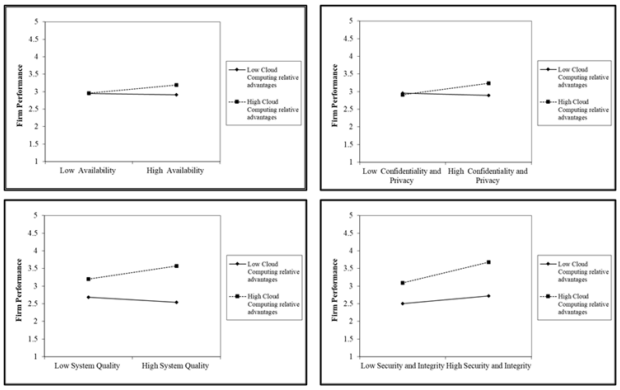

Fig. 4: Moderation Effect of CO between US and PR

6 Discussion

The findings of this study revealed a positive and significant relationship between the system availability, confidentiality and privacy, and security and integrity, with firm performance. However, the relationship between system quality and firm performance is not significant.

As the business becomes more complicated, the availability of data would help the management streamline operations and increase internal efficiency, which will lead to an increase in firm performance [17]. The Jordanian firms also notice the importance of confidentiality & privacy, where the data that is only available to authorized users will enhance the data reliability and contribute to firm performance. Although the previous studies found contradicting result on confidentiality and privacy (such as Martin et al., 2017), this study revealed that the firm could improve its performance by having a proper authorization system to control the data reliability.

The security and integrity of the AIS is another factor that significantly affects the performance of Jordanian firms. Syaeid (2019) mentioned that the AIS with a high level of security and integrity has a significant effect on the reliability of the data [52]. Thus, it can be seen as a factor in providing a reliable information to boost the firm performance. On the other hand, the system quality of AIS is significantly having no plausible impact on the firm performance. This result is inconsistent with the previous studies, such as those by Ren et al. (2017). The Jordanian firms doubt how the AIS's quality can contribute to the firm performance [53]. Since Jordan is a developing country, high investment in system quality in terms of system installation and competent staff, might be the factor that makes the Jordanian firms hinder this factor.

As for cloud computing, it has a significant relationship with firm performance. The Jordanian firms acknowledge that the cloud services are essential to stimulate the firm performance. Using cloud computing technology will nurture superior firm-wide infrastructure capabilities to successfully utilize information technology resources to establish profitable operations [28]. In addition, with the use of cloud computing, it was found that the relationship between system availability and confidentiality & privacy, with firm performance, will be more robust, as including the cloud computing will grant the firms several benefits, like making the system available all of the time and ensure the confidentiality & privacy for everyone. However, it was also revealed that by adopting

cloud computing, the role of the security & integrity and system quality towards the firms' performance would not change, as cloud computing might not ensure the security & integrity or the quality of the system, and other measures are needed to be included in order to enhance them.

7 Practical and Theoretical Implications

In practice, this study has a number of practical implications for the management of financial department of the organizations. The study suggests that the availability of the accounting information systems would reflect the performance of the firms. As well as, Confidentiality and Privacy would get the performance affected by that. In addition to Confidentiality and Privacy, establish the security and integrity of the accounting information systems in an organizational context would reflect and enhance the firm performance. However, accounting information systems' quality have no effect on the firms' performance.

Firms in Jordan, in order to raise the level of their financial and non-financial performance, are advised and recommended to reconsider their concepts on the accounting information systems, as the availability of such systems is vital for the firms' performance. As well as, to implement accounting information systems, their confidentiality and privacy should be tested and assessed as it is a crucial element for the performance of the firms. In addition, the security and integrity of the accounting information systems is another important concept for achieving better financial and non-financial performance. However, accounting information systems' quality is not established as a predictor of the firm performance and can't be a core element of their financial systems management.

Moreover, if the firms realized the advantages of the cloud computing services, the availability of the accounting information systems installed on cloud-based servers will be highly contributing to the performance of these firms. In line with that, Jordanian firms are required to ensure the Confidentiality and Privacy of the accounting information systems when installed on cloud-based servers, as such a factor is crucial for enhancing the firm performance. Secondly, Jordanian firms can maintain a sufficient level of accounting information systems' security, integrity and/or system quality as they may contribute to the performance of the firms, however, having these systems on cloud or locally installed will not make any difference. In addition, the findings of this paper could be implemented to flourish the circular economy in Jordan. As well as, it will help for better ideas about the digitalization of the economy and spot the light on the growing influence of the social media.

One of the most important theoretical implications that it will enrich the body of literature with a holistic study dedicated to the Jordanian firms to boldly conceptualize what are the variables that affect the firms that use cloud computing services for their accounting information systems, which many studies were limited and did not include this aspect. Therefore, this study was well structured to bridge this gap and overcome the problem caused by this gap theoretically. In addition, including the Cloud computing relative advantages in the study as a moderating effect has drawn a new theoretical discipline, by highlighting how this variable could be integrated into the underpinning theories of the current topic, like Contingency Theory, Resource-Based Theory, Goal-Setting Theory of Organizations, and Diffusion of Innovation.

8 Conclusion

This study suggests that AIS plays a vital role in increasing the firm's financial performance. The components in AIS allow the data to be accessible as needed, whenever and wherever required [16]. Through the proper confidentiality & privacy components, the data provided will be more reliable as it comes from the appropriate authorization system. Moreover, security and integrity features shall guarantee the accuracy and completeness of data. In short, these components substantially influence management monitoring through a reliable information system, leading to better firm performance.

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