Contents lists available at GrowingScience

International Journal of Data and Network Science

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Antecedents of cloud-based financial information systems usage: An integrated model

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C H R O N I C L E

Article history:
Received: July 18, 2023
Received in revised format: September 3, 2023
Accepted: October 10, 2023
Available online: October 10, 2023

Keywords:
Information and Communication Technologies
Cloud Computing
Information Technology
Financial Information Systems
COVID-19 Risk
Trust
SMEs

A B S T R A C T

The recent progress of Financial Information System (FIS) has significantly affected businesses' sustainable production process. Businesses generally employ FIS to automate their operational procedures and increase their corporate efficiencies through improvement in output quality and sustainability. The performance of FIS has been attributed to its key success criteria. Accordingly, this study examined antecedents of FIS intention to use among Small and Medium-Size Enterprises (SMEs) in Jordan at individual level, with specific focus on the acceptance and use of FIS among accounting department employees. Based on 436 respondents from Jordanian SMEs, results showed an impact of COVID-19 risk, trust, performance expectancy, and perceived severity on the intention to use FIS, whereas effort expectancy and perceived vulnerability showed no impact on the intention to use FIS among Jordanian SMEs.

1. Introduction

Continuous innovations in information and communication technologies or ICTs have resulted in advancements in technology, contributing to the fast increase in business productivity all over the globe (Al-Okaily, 2023a; Almajali et al., 2023; AlBashayrah et al., 2022). In institutions, the development and applications of ICTs at present time appear to substantially affect the financial information system. Cloud computing (CC) is currently offering its portable progress, and this has increased the interest of SMEs to adopt such technology (Gupta et al., 2013; Moudud-Ul-Huq et al., 2020). Accordingly, the increased use of cloud-based ISs has resulted in the increase in business process outsourcing owing to lower transaction cost of cloud-based ISs (Asatiani et al., 2019). Cloud-based solutions are indeed affordable, and for SMEs with lacking resources and experiences, cloud-based ISs are an attractive option for running their businesses (Sultan, 2014).

In their study, Moudud-Ul-Huq et al. (2020) mentioned that the movement of the conventional FIS to cloud can conserve substantive assets to SME ventures. Additionally, in accounting services including basic book-keeping, invoicing, e-ledger, production of report, and other solutions for accounting and finance, cloud-based FIS applications make up a substantial part. In this regard, in Jordan, the Policy of Cloud Platforms and Services 2020 has been introduced by the Ministry of Digital Economy and Entrepreneurship. According to the ministry, cloud services may be delivered through the following: Infrastructure as a Service or IaaS, Platform as a Service or PaaS, and Software as a Service or SaaS. Among these three categories, the

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ISSN 2561-8156 (Online) - ISSN 2561-8148 (Print)

doi: 10.5267/j.ijdns.2023.10.010

SaaS services category may involve the use of accounting software and tools for managing documents (MoDEE, 2020). Meanwhile, a cloud-based FIS is a form of CC application for financial data processing purposes (Yau-Yeung et al., 2020). With CC solutions, activities such as FIS installation, and storage and processing data from on-premises servers are moved to the servers of cloud service providers or CSPs (Adjei et al., 2021).

Cloud-based FIS allows organizations access to inexpensive information systems, better data processing capacity, in addition to functionality of cooperation, in real-time (Asatiani et al., 2019; Mell & Grance, 2011; Armbrust et al., 2010). Nonetheless, there are also risks and disadvantages to cloud-based accounting practices. For instance, cloud accounting solutions that CSPs provide to the clients via public cloud paradigm will need organization data, some of the data at least, to be hosted in data centers belonging to a third party, which, according to Paquette et al. (2010), could result in privacy, security and trust issues. Additionally, there has been concern over loss of data control and also loss of location independence of the hosted resources when data are migrated to cloud-based FIS (Al-Okaily, 2023b; Zissis & Lekkas, 2012). Accordingly, untrustworthy computing, data storage and service availability are among the concerns associated with cloud solutions (Zissis &Lekkas, 2011). Notably, cloud-based systems that offer secure and efficient data migration to the cloud infrastructure are the ones that clients seek, because such systems allow storage of financial and accounting data of organizations within a trustworthy environment. Cloud-based FIS adoption is affected by the technology's strengths and weaknesses, and so, it is important that the factors affecting cloud-based FIS are identified so that user acceptance and use of cloud-based FIS could be increased, particularly among SMEs in developing countries like Jordan (Al-Kofahi et al., 2023; Al-Fraihat et al., 2022). For SMEs, using online ICTs like cloud applications can ease the streamlining of their delivery of services to businesses, clients and other stakeholders. Most notably, during crises like COVID-19, the use of this technology significantly facilitates business survival as it allows businesses to enhance their services delivery, and their cooperative and communications endeavors (Alhomdy et al., 2021). Online services utilization has indeed been promoted by the World Health Organization (WHO) during the pandemic of corona virus COVID-19 so that the spreading of the virus could be minimized (Almajali et al., 2022).

The current work was carried out mainly to ascertain the determinants impacting the willingness of users in using cloud-based FIS. In particular, this empirical study examined these information systems in terms of their adoption from the theoretical perspective. Comparatively, past studies on FIS adoption and use were focusing on the financial information systems that store the software as well as the data on the standard client-server model (Ibrahim et al., 2020; Masa'deh, 2012). On the other hand, in CC technology, software and data are placed in the data center owned by the CSPs. For this reason, the applicability of earlier findings to this innovative paradigm needs to be explored. Similarly, considering that past FIS studies were performed under normal settings, it is worthy to examine FIS during crises such as during COVID-19 epidemic, to see how crises would impact cloud-based FIS usage. Notably, during the pandemic, online services became the new norm and even a necessity. In addition, cloud-based FIS systems studies were mostly focusing on only one application of cloud together with the implementation of the said application at the organizational level. In other words, these studies were mostly focusing on the side of supply (Lian, 2015).

The currently used cloud accounting services among Jordanian SMEs are closely related to each other. Nonetheless, examining the accounting applications as a whole would be appropriate. For many organizations, the use of CC services gives them a competitive advantage or facilitates their survival within the information industry. Cloud applications have been approved by many. However, the decision of organization towards Information Technology (IT)/Information System (IS) adoption in this regard does not mean the people working in the organization will also accept it too (Ai Ping et al., 2023a; Bany Mohammad et al., 2022), and so, the adoption of individuals of CC became the subject of interest in this work. In particular, the current work examined all applications of cloud accounting at individual level, which represents the demand side.

Certain well-established theories and models can be used in examining IT/IS adoption. This study has chosen the Unified Theory of Acceptance and Use of Technology (UTAUT) model to become its theoretical model owing to the appropriateness of the model to the study context and its superiority performance-wise (Venkatesh et al., 2003). Utilizing the extended UTAUT as base, an integrated study framework was constructed, and the framework was validated with the gathered study data. The constructs of Behavioral Intention (BI) and Performance Expectancy (PE) were tested in the study model. Both these constructs had not been examined much considering the links between COVID-19 risks, and the significance of these constructs to the study context. Arguably, this study was the first to investigate these two relationships in cloud systems acceptance and use, especially within the context of cloud FIS. In guiding this study, two key questions were addressed as can be read below:
1. What are the factors imparting major impact on the cloud-based FIS applications adoption within the Jordan context?
2. Does COVID-19 affect the intention of users toward using cloud-based FIS?

2. Literature Review

2.1 Cloud computing

Cloud Computing (CC) encompasses a technology that generates ubiquitous, handy, and on-demand network access to a mutual body of customizable computing resources like servers, networks, applications, storage, and services, and these resources can be quickly supplied and discharged with little management work or interaction with service provider (National

Institute of Standards and Technology (NIST),). In their study, Mell and Grance (2011) accordingly listed down five key features of the cloud paradigm as follows: on-demand self-services, diversified network availability, resources pooling, fast elasticity, in addition to quantified services. In assuring clients that they will enjoy development, operation, and hosting services and applications, with flexibility, unbound by time and place through the use of internet-enabled devices, the cloud service providers (CSPs) provide their clients with on-demand computing resources. As indicated by NIST, the service models encompass PaaS, SaaS, and IaaS. These service models are for delivering the services to the customers. Additionally, CSPs could offer cloud services via their data centers, that is, through their public cloud model. CSPs could also offer services through client organizations, that is, through end-users, through cloud-based software running within the data center of this organization as exemplified by the private cloud model. Alternatively, the software could be run within the organization and other data centers of CSPs as can be exemplified by hybrid cloud model (Ai Ping et al., 2023b; Singh et al., 2016; Sultan, 2014; Mell & Grance, 2011).

2.2 Vitality of cloud computing components during crisis times (COVID-19 pandemic)

Cloud computing services and applications have been deployed and employed by organizations during COVID-19 pandemic to ease activities such as information documentation, and data management as well as collaboration, to increase efficiency and productivity (Singh et al., 2021). There are four key components of cloud to be organized together so that the objective of cloud paradigm could be reached. These components include: 1) cloud applications which are employed within CC software architectures to allow employee access to shared organization data, 2) cloud platforms encompassing programs infrastructures as well as services (Singh et al., 2021), 3) cloud clients encompassing configurations of programs and computers configured specifically for cloud service usage (cloud service entails the resolution, product and service utilized for delivery purposes in real time), and 4) cloud storage which keeps each and every record, shareable report of finance nature, data and additional information.

Cloud computing appears to have considerably decreased the impact imparted by COVID-19 on society. Within the context of higher education institutions (HEIs), Al-Bashayreh et al. (2022) reported that the pandemic has led to the move of academic staff and students from traditional learning to distance learning. The pandemic has created both hurdles and prospects, and this adds to the knowledge of distance learning while also presenting comprehensive knowledge on the procedures of moving towards technologies that are grounded upon cloud model, to create a fitting interaction method between students as learners and their corresponding HEI. Accordingly, the application of industry 4.0 technologies was studied by Singh et al. (2020) with the purpose of dealing with challenges during lock-down and crises. Additionally, in their study, Pujazon and Carr (2020) explored the significance of cloud technology not only in easing remote data access, but also in easing information and storage during the pandemic of COVID-19, an effort to avert infection risk and assure survival of business in all sectors.

In theory, cloud computing is not a new concept. Still, cloud accounting or cloud-based FIS is considered a revolution in business, accounting and finance domains. Cloud accounting entails an ensemble of accounting services remotely hosted on cloud model, and various end-users can always access these services and locations (Dimitriu & Matei, 2014). The services of cloud FIS are conveyed to the clients through the internet, and Yau-Yeung et al. (2020) additionally mentioned that the flexibility of these applications allows different types of authorized devices like desktops, laptops, tablets and smartphones to gain access to the related computing resources. At present time, financial reporting with cloud-based FIS platforms involves the combined use of disruptive technologies like Artificial Intelligence (AI), blockchain and big data (Akter et al., 2020). There are various names to describe cloud accounting services, for instance, "online accounting," "virtual accounting system," "web accounting," "SaaS accounting software" or "cloud-based accounting" (Sastararuji et al., 2021; Akter et al., 2020). In general, as described by Yau-Yeung et al. (2020), cloud-based FIS is delivered via the SaaS model which, at the global level, makes up most of public cloud services. For subscription fees, CSPs provide cloud FIS (software) to organizations, and these organizations are allowed to utilize the application in dealing with various forms of transactions involving money (financial transactions) (Almaqableh et al., 2022, Dimitriu & Matei, 2014).

2.3 Critical determinants for cloud-based financial information systems adoption

IS/IT adoption has been expounded using some theoretical models. Among these models include Technology Acceptance Model or TAM, Theory of Planned Behavior or TPB, TAM and TPB used in combination, Theory of Reasoned Action or TRA, Social Cognitive Theory, and Diffusion of Innovation or DOI. Motivational Model and Model of PC Utilization have been used as well. In addition, some studies employed Unified Theory of Acceptance and Use of Technology or UTAUT. UTAUT encompasses a blend of the theories and models. The main aim of UTAUT was to gain comprehension on the adoption and use of IT/IS of users. Accordingly, in UTAUT, there are four primary determinants of BIs and actual usage (AU) of IT/IS as follows: perceived effort (PE), effort expectancy (EE), social influence (SI) and facilitating conditions (FC). Accordingly, in UTAUT, there are four moderating variables proposed to have impact on the direct relations as follows: gender, experiences, age and usage voluntariness (Venkatesh et al., 2003). UTAUT has been expanded and it is called UTAUT2 (Venkatesh et al., 2012; Venkatesh et al., 2003). The significance of information systems that are grounded upon cloud (e.g., cloud FIS) has led to the interest towards examining the systems' acceptance and use. Several theoretical models were used in these studies in examining IT/IS adoption, for instance: TAM as demonstrated in Arpaci (2017) and Shin (2013),

Technology-organization-environment (TOE) framework as demonstrated in Khayer et al. (2020) and Al-Okaily et al. (2022), and institutional theory. Accordingly, the theoretical models popularly employed in examining IT/IS acceptance can generally be classed into two types of models namely models at organization level such as TOE and DOI and those at individual level such as TAM and also UTAUT. In this research domain, TAM and its derivatives have been the most popularly employed individual-level theoretical model (Alam et al., 2020). Somehow, TAM does not include the factor of "subjective norm" aside from having low explanatory power (about 40%). Shareef et al. (2017) added that TAM lacks the capacity in comprehensively predicting the behavior of users towards internet-based technology like cloud-based FIS. Furthermore, Alalwan et al. (2017) indicated that the TAM application seems more apt in organizational settings.

Unified theory of acceptance and use of technology or UTAUT was created by Venkatesh et al. (2003). As a theory, UTUAT is a more comprehensive theory in comparison to other commonly used theories or models that explore technology acceptance and usage, and it addresses the shortcomings of previous related models and theories. Scholars have been using UTAUT in expounding IT/IS adoption from an individual's viewpoint (Dwivedi et al., 2019). Additionally, the model of UTAUT has been used in examining the acceptance of different forms of online services, for instance, mobile payment services (see: Patil et al., 2020), mobile banking services (see: Bhatiasevi, 2016), mobile government applications services (see: Sharma et al., 2018), and mobile health services (see: Alam et al., 2018; Dwivedi et al., 2016). Hence, UTAUT model being used in varied domains of IT demonstrates its adequacy as an instrument for measuring IT/IS adoption, like the adoption of Cloud-based FIS. Innovative technologies are on the rise and applications and services are consistently evolving, and so, the unified theory should be expanded as it still lacks the basic theoretical development. In understanding users' IT/IS adoption, constructs that correspond to each context should be integrated (Venkatesh et al., 2003; 2012). Furthermore, cloud technology has unique features, and so do FIS and the use of technology during crises such as during COVID-19 outbreak. As such, the utilization of UTAUT, in examining the acceptance of users towards cloud-based FIS following the pandemic, should be investigated. As such, variables that are deemed relevant like COVID-19 risk, Perceived severity, Perceived vulnerability and trust need to be included in UTAUT. Furthermore, it should be noted that UTAUT does not address IT usage outcomes, for instance, the quality and performance effect. Notably, IT/IS usage and adoption studies were mostly focusing on AU as the ensuant variable (see: Al-Okaily et al., 2021a, 2021b; Ronaghi & Forouharfar, 2020; Sultana, 2020; Masa'deh & Shannak, 2012). Additionally, the link between the usage of IT and perceived performance has been examined (see: Son et al., 2012).

3. Research model and hypotheses development

Clearly, the accounting industry could greatly benefit from CC technology, Still, a lot of organizations were still utilizing the traditional methods and resisted the use of IT like CC in their practices associated with finance and accounting. Accordingly, the impact of cloud accounting software and financial infrastructure on SMEs' business performance was investigated by Cleary and Quinn (2016) and it was found that CC benefits by providing business processes and technology applications that are efficient, decision-making that are better, and lower cost incurred by SMEs. The authors somehow mentioned that firms were reluctant to adopt cloud-based FIS mainly owing to security concerns. In fact, as reported in studies including Paquette et al. (2010) and Zissis and Lekkas (2012), security and privacy risks are the major drawbacks in the use of cloud-based services. Figure 1 provides the illustration.

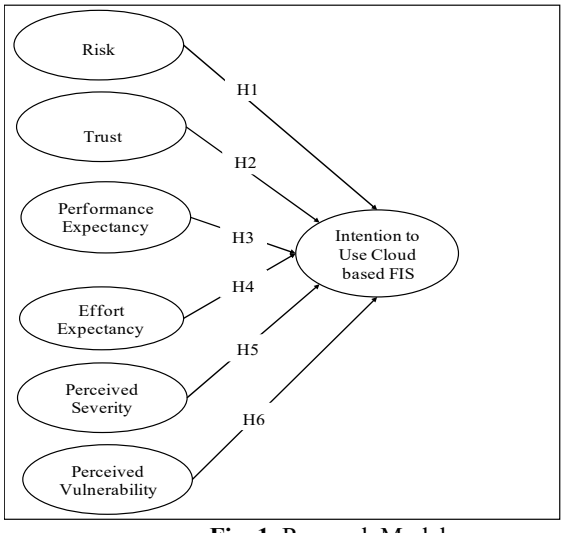

Fig. 1. Research Model

IT adoption seems to be majorly affected by the variables of perceived security, trust and perceived risk - these variables have been included in the expansion of UTAUT model (Kurfalı et al., 2017), and in the theoretical model of this study as well, but with some modifications to accurately fit the study context. Appositely, Aji et al. (2020) studied e-wallet usage and reported

significant impact of the risk factor associated with COVID-19 on perceived usefulness and BIs. Al-Okaily (2022) study, examined COVID-19 risk's impact in the applications of detection of coronavirus exposure . Countless of studies have indeed examined cloud-based applications adoption (e.g., Sastararuji et al., 2021; Cleary & Quinn, 2016) but most were examining the subject from the viewpoint of organization, rather than from the viewpoint of individual, and therefore, there was a literature gap that needed to be bridged. In other words, there seemed to be an academic knowledge gap in cloud-based FIS literature particularly on its acceptance and use at the individual level, and so, the present study attempted to investigate cloud FIS adoption from the viewpoint of individuals.

3.1 Risks of cloud-based financial information systems

Disease risk can be defined as the possibility of people being affected by epidemics like SARS, AIDS, COVID-19, and the like (Godovykh et al., 2021). Hence, in curbing the risk of COVID-19 spread, the utilization of online services like cloud-based services has been regarded as among the best solutions. Relevantly, an adverse impact of perceived risk on BI has been reported in certain contexts (Sharma et al., 2020) for instance, in online shopping as reported by Chang and Wu (2012), tourism as reported by Quintal et al. (2010) as well as in internet/ online banking as reported by Sharma et al., 2020. Within the context of the present study, the higher the risk of COVID-19 as perceived by users when using the traditional FIS at the workplace will intensify the intents of users to adopt cloud-based FIS to perform their financial transactions from home. Additionally, PE predicts the decision of user towards using a given information system (Venkatesh et al., 2012; Venkatesh et al., 2003), and so, in the midst of COVID-19 pandemic, PE of cloud-based FIS will stimulate user towards adopting cloud accounting. Hence:

H_1: *COVID-19 risk will influence users' behavioral intention toward cloud-based FIS adoption positively.*

3.2 Trust

The impact of trust (TR) on the intentions of users towards the adoption of cloud-based FIS was considered in this study. In this regard, Carter and Bélanger (2005) indicated that "trust of the internet" and "trust of e-government" will have an impact on the intent of individuals towards utilizing e-government systems. It should be noted that users at present time have high awareness of the internet usage, and so, this study did not consider the variable of "trust of the Internet" important. Nonetheless, when citizens decide to adopt e-government, TR is important as it has an impact on their decision (Alsmadi et al., 2022; Alqudah et al., 2022; Lallmahomed et al., 2017; Abu-Shanab, 2014). Furthermore, TR will affect usage behaviors in e-payment services (Kim et al., 2010). As such, TR is expected to impact user's BIs toward cloud-based FIS positively and significantly. Hence:

H_2: *TR will influence users' behavioral intention toward cloud-based FIS adoption positively.*

3.3 Performance expectancy

Performance expectancy of PE can be understood as the level to which one is sure that certain system's usage will facilitate one's achievement of job performance (Venkatesh et al., 2003), and is regarded as a significant predictor of the readiness of user in adopting IT, through which, they could perform better (Sultana, 2020). It is more likely for people with high-level PE to use e-government systems (Kurfalı et al., 2017). Sharma et al. (2018) additionally mentioned that BI of individuals towards m-government applications is significantly impacted by performance expectations. When discussing cloud-based information systems adoption, PE consists of the belief of users that the utilization of cloud-based systems would make their job better in terms of quality, efficiency, and performance. As the belief of users that cloud FIS will enhance their performance will affect cloud-based FIS positively, this study was to test the following:

H_3: *PE will influence users' behavioral intention toward cloud-based FIS adoption positively.*

3.4 Effort expectancy

Effort expectancy or EE can be described as the level of ease concerning system usage (Venkatesh et al., 2003). Studies that employed UTAUT as a theoretical model considered EE a major determinant, particularly in the investigation of the adoption of individuals of IT/IS (Sharma et al., 2018). In the use of the Internet of Things (IoT), Ronaghi and Forouharfar (2020) reported a direct impact of EE on BI. In their study on public cloud storage services, Song et al. (2020) reported significant impact of EE on users. When discussing cloud-based FIS adoption, EE denotes the expectations of users towards the use of cloud accounting effortlessly, considering that these applications are internet-based. Thus, it was supposed that in cloud technology usage, ease would have a significant impact on BI of users. It was hypothesized that user intention to use cloud-based FIS will increase when the cloud platform makes accounting practices and financial transactions easier. Hence, this study proposed the following:

H_4: *EE will influence users' behavioral intention toward adopting cloud-based FIS positively.*

3.5 Perceived severity & Perceived vulnerability

The process of threat appraisal involves the evaluation of a given threat in terms of its severity and vulnerability, and in this study, the threat is the potential transmission of Covid-19 through physical exchange of physical money (coins and banknotes), between merchant and buyer. Money generally comes in currency notes and coins, and owing to its regular spreading in day-to-day socioeconomic life, money could well be polluted with germs and viruses (among others) including coronavirus. In fact, the surfaces of banknotes and coins could become a nesting ground for many types of bacteria and viruses, somehow, the risks of transmissibility of these bacteria and viruses remain to be explored (Tamele et al., 2021; Thomas et al., 2008). Additionally, banknotes can become agents of pathogens that are resistant to drugs (Heshiki et al., 2017) and microbes that have been associated with common respiratory infections (Tamele et al., 2021; Heshiki et al., 2017). Furthermore, simulations executed in laboratories showed the ability of bacteria and viruses in remaining alive on banknote and coin surfaces for as long as 13 days (Kramer et al., 2006).

Unhygienic habits of humans can facilitate the transmissions of infectious human pathogens through money (Thomas et al., 2008). Money touched or handled by hands contaminated by germs, viruses or pathogens resulting from unhygienic habits (e.g., bare hands after being used for covering sneezes or coughs) can be contaminated. Microbes generally would get into the human body via the mucous membranes found in the nose, eyes as well as mouth of human. As such, hand-to-face touching behaviors can increase infection risks. Kwok et al. (2015) in their study found that within the duration of one hour, people would touch their face 23 times, and most times, the touching was on areas with mucous membranes. Meanwhile, a conventional retail transaction usually would involve physical contact of human hand with banknotes, which can lead to disease transmission risks. Pertinently, transmission of COVID-19 from contaminated banknotes must be averted. Hence, WHO had released an advisory for shoppers in early 2020 to opt for contactless payments (Gardner, 2020). People have then resorted to using contactless channels to shop and deliver goods, to distance themselves from others physically (Kakushadze & Liew, 2020).

Considering the discussion above, cloud computing-AI, in theory, could be propelled by the aforementioned evaluation of microbial- and public-health-related threats. Hence, the use of cloud computing-AI, just like that of other successful measures of physical distancing, would minimize and prevent the risks of COVID-19 transmission or that of other microbial infections. Notably, shoppers viewed that perceived severity and vulnerability were linked to technology use intention (Le, 2022; Sreelakshmi & Prathap, 2020). The hypotheses below were hence proposed:

H_5: *Perceived severity will influence users' behavioral intention toward adopting cloud-based FIS, positively.*
H_6: *Perceived vulnerability will influence users' behavioral intention toward adopting cloud-based FIS, positively.*

4. Research Methodology

4.1 Participants and data collection

This quantitative research obtained data through a survey method to validate the research framework. In Jordan as of 2016, there were 17,849 registered SMEs - these SMEs were registered to the Jordan Chamber of Industry (JCI, 2017). A total of 600 registered SMEs were selected in this study, and from these SMEs, the study samples were chosen using a convenient sampling method. The study samples were prospective and present users of cloud-based FIS - these samples were staff in accounting departments of Jordanian SMEs who had knowledge of the use of cloud-based accounting services. Questionnaire was the method used in obtaining the study data, and the questionnaire was conveyed to the study samples online (online link) and several channels of communication were used in delivering the questionnaire link, including email, mailing lists, and social media groups. All study participants voluntarily took part in the survey, and the survey was carried out in December 2021. The study respondents completed the online survey based on their personal thoughts on cloud accounting adoption. Prior to taking the survey, they (the respondents) were made aware of the research objectives and their rights as respondents. They were allowed to abandon the survey at any time.

Prior to the actual survey, the questionnaire underwent a pretest involving 15 practitioners and academic researchers with expertise in cloud-based services, in accounting services especially. Several items were altered slightly in order to fit the study context, following the obtained feedback. The alterations were made to the items to make them clearer, simpler and more fitting to the study context. Also, the questionnaire used in this study was in Arabic version because the respondents were mostly Arab speaking individuals, and the use of Arabic questionnaire would facilitate their understanding of the questionnaire items and hence their provision of the most accurate responses. Notably, the questionnaire was in English, originally. Then, the aforesaid questionnaire was translated into Arabic using a method known as the back translation method. The translation work was performed by four individuals, two of whom were academics from public Jordanian universities while the remaining two were Jordanian linguist teachers.

The exact number of target population members is unknown, and so, knowing exactly the number of people to fulfill the sampling criteria of this study is impossible. For this situation, and also for the target population that is too big, Daniel (2011) mentioned that 384 can be regarded as the most appropriate sample size (65% error margin of error, at proportion value of 0.05 and 0.95 level of confidence). A total of 522 completed questionnaires were received, and 436 were usable for analysis. Exhibited in the following Table 1 are the obtained demographic data of the study respondents.

Table 1
Details of the demographic profiles of respondents

Category	Category	Frequency	Percentage%
Gender	Male	221	0.51
	Female	215	0.49
	Total	436	100.0
Age	20 years old or younger	23	0.05
	Between 20 and 30 years old	50	0.12
	Between 30 and 40 years old	300	0.69
	40 years old or older	63	0.14
	Total	436	100.0
Education level	Bachelor degree	191	0.44
	Master degree	201	0.46
	Ph.D.	18	0.04
	Others	26	0.06
	Total	436	100.0
Number of years in service	<3 years	214	0.49
	3-5 years	111	0.25
	6-11years	75	0.17
	>11 years	36	0.08
	Total	436	100.0

Table 1 detailing the demographic profiles of the study respondents is showing that males and females were nearly equal in fraction, with males representing slightly more of the overall sample at 51%. With respect to the ages of the respondents, a large chunk belonged to the group of between 30 and 40 years old at 69%. For the category of education; the majority were holders of Master's degree at 46%, and most (49%) had been working for less than three years.

4.2 Data Analysis and Results

The characteristics of the study respondents were ascertained using descriptive analysis as displayed in Table 1. As a recap, all constructed items were equipped with 5-point Likert scale, ranging from the scale of 1 to denote the response of "Strongly Disagree" to the scale of 5 to denote the response of "Strongly Agree." The items were checked for reliability and validity. This study performed multiple regression analysis in testing the proposed hypotheses.

4.3 Descriptive analysis

The mean and the standard deviation of the obtained data were estimated to comprehend the attitude of respondents towards the survey items. Specifically, the mean signifies the central tendency of the data, whereas the standard deviation shows the distribution denoting the variability or spread index within the data (Sekaran & Bougie, 2013; Pallant, 2005). Hence, values that form small clusters are denoted by a small standard deviation and vice versa. For each item, its level was ascertained through the formula below:

(Highest point in Likert scale - lowest point in Likert scale) / the number of the levels used = (5-1) / 5 = 0.80

From the formula above: the obtained value of between 1 and 1.80 can be construed as "very low," that between 1.81 and 2.60 can be construed as "low," that between 2.61 and 3.40 can be construed as "moderate," that between 3.41 and 4.20 can be construed as "high," while that between 4.21 and 5 can be construed as "very high." The survey items were then ordered according to their scored means, and the results can be viewed in detail in Tables 2 and 3.

Table 2
Overall mean and standard deviation of the study variables

Type of Variable	Variables	Mean	Standard Deviation (SD)	Level	Order
Independent Variables	Covid-19 Risk (CR)	2.6003	1.01319	Very low	4
	Trust (TR)	3.5784	0.74117	High	1
	Performance Expectancy (PE)	2.8800	0.40980	Moderate	3
	Effort Expectancy (EE)	3.0011	1.23933	Moderate	2
	Perceived Severity (PS)	2.5372	0.97216	Low	5
	Perceived Vulnerability (PV)	2.5126	0.91483	Low	6
Dependent Variable	Intention to Use Cloud based FIS (INFIS)	2.6093	0.86246	Moderate	-

Table 3
Mean and standard deviation of the study constructs

Risk (CR)	Mean	SD	Level	Order
I am worried I would catch Coronavirus when I use FIS at my workplace	2.63	1.245	Moderate	2
I feel that Covid-19 will affect my current colleagues	2.51	1.214	Low	3
It is better to use cloud-based FIS at home because there might be Coronavirus drop-	2.48	1.242	Low	4
During COVID-19 pandemic, it is safe to choose using cloud-based FIS	2.78	1.194	Moderate	1
Trust (TR)	Mean	SD	Level	Order
I have faith in institutions and departments that utilize cloud-based FIS	2.98	1.244	Moderate	5
I have faith in the capabilities of institutions and departments in securely and effectively	3.80	1.000	High	1
I am confident that institutions and departments that utilize cloud-based FIS would pri-	3.75	1.018	High	2
I am confident that the technical and legal infrastructure of cloud-based FIS provides	3.65	1.172	High	4
Cloud-based FIS can generally be trusted, and so, I can use it to perform accounting	3.72	1.078	High	3
Performance Expectancy (PE)	Mean	SD	Level	Order
I can complete my transactions faster when I use cloud-based FIS	3.56	1.103	High	2
Transactions are more productive with cloud-based FIS	2.36	1.074	Low	4
The use of cloud-based FIS gives faster outcomes for client	2.28	1.067	Low	6
Employees perform better when they use cloud-based FIS	2.35	1.094	Low	5
Transactions are easier with cloud-based FIS	3.73	1.072	High	1
Cloud-based FIS is generally useful	3.00	1.240	Moderate	3
Effort Expectancy (EE)	Mean	SD	Level	Order
It is effortless to learn to use cloud-based FIS	3.10	1.245	Moderate	3
It is effortless to use cloud-based FIS	3.08	1.240	Moderate	4
Cloud-based FIS has straightforward use process	3.00	1.237	Moderate	6
Using cloud-based FIS is not burdensome during transactions	3.05	1.245	Moderate	5
It is simple to recall cloud-based FIS use	3.15	1.241	Moderate	1
Cloud-based FIS is generally easy to utilize	3.12	1.241	Moderate	2
Perceived Severity (PS)	Mean	SD	Level	Order
Covid-19 infection may cause poor immune system	2.59	1.179	Low	1
Infected by Covid-19 will distress me greatly	2.57	1.178	Low	2
Covid-19 infection may lead to my death	2.44	1.138	Low	5
Perceived Vulnerability (PV)	Mean	SD	Level	Order
Being infected by Covid-19 is possible for me	2.56	1.218	Low	2
People like me have high chance of being infected by Covid-19	2.57	1.150	Low	1
I may catch Covid-19 without realizing it	2.53	1.135	Low	3
I am likely to catch Covid-19	2.41	1.120	Low	4
Intention to Use Cloud based FIS (INFIS)	Mean	SD	Level	Order
I plan to use cloud-based FIS	2.53	1.167	Low	2
Cloud-based FIS use is possible for me	2.52	1.309	Low	3
It is my hope to be a user of cloud-based FIS	2.77	1.343	Moderate	1

Reliability and validity

Researchers must assure that the instrument developed for measuring certain concept measures the variables accurately (Sekaran & Bougie, 2013). Hence, the reliability and validity of the instrument must be ascertained, by way of reliability analysis and validity analysis. Analysis of reliability involves consistency level assessment between various measurements of a variable, while analysis of validity involves evaluation of the level to which a scale or set of measures correctly typifies the construct (Hair et al., 2010). Cronbach's alpha coefficient has been commonly applied in measuring the instrument's reliability, and Bagozzi and Yi (1988) opined that the Cronbach's alpha values for all indicators or dimensional scales should be 0.60 at least. For the independent variables in this study, the obtained values of Cronbach's alpha were: Covid-19 Risk = 0.85, Trust = 0.70, Performance Expectancy = 0.76, Effort Expectancy = 0.90, Perceived Severity = 0.88, and Perceived Vulnerability = 0.74. Meanwhile, the obtained value of Cronbach's alpha for the dependent variable namely the Intention to Use Cloud based FIS was 0.70. As can be concluded based on the recommendation of Bagozzi and Yi (1988), the instrument showed reliability.

4.4 Multiple regression analysis

The one-to-one relationships between the variables were checked in this study, through the use of Pearson's correlations test. Results showed that all the proposed relationships had significant correlations ($P < 0.01$). As highlighted in Table 4, resultant correlation strength values were between 0.203 and 0.472. In other words, the study variables had strong positive relationships with one another, and that divergent validity existed because there seemed to be no signs of multicollinearity between the independent variables. Correlation matrix for all relationships can be viewed in Table 4. The relationship strength and direction between each pair of variables can thus be examined.

Table 4
Outcomes of Pearson's bivariate correlations matrix

Constructs	CR	TR	PE	EE	PV	PS	INFIS
CR	1						
TR	0.203**	1					
PE	0.319**	0.211**	1				
EE	0.401**	0.428**	0.318**	1			
PV	0.209**	0.333**	0.222**	0.336**	1		
PS	0.333**	0.274**	0.462**	0.229**	0.357**	1	
INFIS	0.411**	0.219**	0.205**	0.472**	0.223**	0.338**	1

The hypotheses proposed in this study was tested using multiple regression analysis which encompasses a statistical method analyzing the link between a dependent variable and multiple independent variables. Covid-19 Risk, Trust, Performance Expectancy, Effort Expectancy, Perceived Severity, and Perceived Vulnerability were the independent variables examined in the present study, while intention to use cloud-based FIS was the study's dependent variable. From the obtained results, the research model showed that it explicated 50.1% of the variance in intention to use cloud-based FIS. In other words, nearly half of the variability in intention to use is explicable via the independent variables in the proposed model. The obtained explained variance can be classed as moderately high. Hence, the model can be considered as fit and powerful in describing the relationship between the independent variables and the intention to use cloud-based FIS. Hypotheses test results can be viewed in Table 5, Table 6, and Table 7.

Table 5
Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.811[a]	.657	.653	.50839

a. Predictors: (Constant), CR, TR, PE, EE, PS, PV

b. Dependent Variable: INFIS

Table 6
ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	212.686	6	35.448	137.148	.000[b]
	Residual	110.880	429	.258		
	Total	323.567	435			

a. Dependent Variable: INFIS

b. Predictors: (Constant), CR, TR, PE, EE, PS, PV

Table 7
Coefficient of predictors [a]

Model	Unstandardized Coefficients		t	Sig.	Result of hypothesis testing
	B	Std. Error			
(Constant)	0.641	0.286	2.242	0.025	
CR	0.095	0.038	2.489	0.013	Accept the hypothesis
TR	0.116	0.050	2.330	0.020	Accept the hypothesis
PE	0.083	0.076	1.099	0.000	Accept the hypothesis
EE	0.075	0.036	2.112	0.235	Reject the hypothesis
PS	0.167	0.059	2.830	0.005	Accept the hypothesis
PV	0.497	0.062	7.967	0.278	Reject the hypothesis

a. Dependent Variable: INFIS

5. Discussion and Conclusions

The present study examined the threats and coping assessments that impact the intent of SMEs in continuing their cloud-based FIS adoption during Covid-19 pandemic, by examining the variables of perceived severity and perceived vulnerability (among others) in the threat appraisal. Several hypotheses were proposed, and results showed significant support to all, with the exception of the hypothesis on the effect of perceived vulnerability and effort expectancy on the intent to use cloud-based FIS. Such results can be justified by the intensity of the pandemic situation and the hard-hitting promotion by the stakeholders. Concerning SMEs' threat assessments, perceived severity was the only construct that predicted the SMEs' continued intention towards FIS usage.

As for the construct of perceived vulnerability, results showed that it had a negligible effect on cloud-based FIS adoption, which means that SMEs perceived that the risk and harm caused by the threat were more important than being exposed to the

threat itself. As such, concerning COVID-19 infection, results showed presence of fear among users, particularly of the trauma and encumbrance inflicted by the disease, and such fear triggers the intent of user to continue the new technology adoption (Lu & Kosim, 2022), but in this study, perceived vulnerability or fear of infection did not seem to impact the decision of respondents in continuing their usage of cloud-based FIS; merchants were more wary of COVID-19 health-related risks and burden than the fear of being infected with the coronavirus.

Cloud-based FIS adoption among accounting department staff in SMEs was analyzed in the present study utilizing the UTAUT model with the addition of the factors of COVID-19 risk, perceived severity, perceived vulnerability and trust as antecedent factors of behavioral intention towards cloud-based FIS. The outcomes showed that UTAUT was effective in providing superior theoretical understanding of cloud-based FIS adoption among SME staff. Results showed a positive impact of PE on cloud-based FIS adoption, as also reported in past studies like Kurfalı et al. (2017), Sharma et al. (2018) and Sultana (2020). As such, finding cloud computing useful will increase the likelihood of employees to have better opinions about IT usage in performing financial transactions. It is hence crucial to improve cloud accounting services in accordance with the suggestions and viewpoints of accountants as this will increase the number of users and satisfy the needs and expectations of these users. In doing so, practitioners should provide user's manuals with elaborated guidelines on the benefits and features of cloud accounting and applications that enable transactions to be performed at all times and places.

Contrariwise, the results showed effort expectancy an insignificant determinant of user intention in cloud-based FIS usage, like the finding of Al-Azawei and Alowayr (2020). However, other studies including Ronaghi and Forouharfar (2020), Song et al. (2020), Sharma et al. (2018) and Venkatesh et al. (2003) concluded the opposite. As a potential justification, as cloud-based FIS services appear more user-friendly, users will feel less concerned, and their usage of these online applications would be mainly factored by the "perceived usefulness" rather than the "ease of use" of the applications. For this reason, it is necessary that CSPs make the interfaces of the cloud-based applications more user-friendly, so that those with less IT skills would still be willing to accept and adopt the services. Lack of familiarity of users with the system usage increases the significance of EE as a determinant (Venkatesh & Zhang, 2010). It is thus necessary for designers and developers of cloud-based FIS to make the system exploration and usage less complex. In addition, the provision of training courses and help desks will increase user expertise in cloud FIS usage.

6. Theoretical implications

UTAUT was used in this study and the model proved its capability to predict cloud-based FIS adoption among staff of SMEs. Accordingly, the outcomes obtained by this study could add to the literature, as UTAUT was expanded in this study through the inclusion of some factors in examining cloud accounting adoption at the individual level. The model proposed in this study could assist future studies in gaining broad insights into cloud-based services adoption. The inclusion of the factor of "COVID-19 risk" in the model has led to the prediction of employee performance indirectly and effectively. Notably, results showed the ability of the study framework in spotting the link between the key factors presented in the model, in expounding BI of the user. In addition, considering the lack of studies on cloud-based FIS, this study could create new avenues for future studies in the field. Furthermore, the addition of other factors like the factor of COVID-10 risk and the factor of trust, was paramount to the research context, as they seem important to the acceptance and use of cloud-based FIS. The findings that this study had gained essentially add to the academic streams, particularly in the use of the UTAUT model in different contexts, especially within the context of cloud accounting services.

7. Practical implications

Cloud technology alongside its applications are consistently evolving, allowing both governments and CSPs to increase their cloud accounting applications in terms of scope and number. The findings showed BI toward cloud accounting as a positive determinant of actual use of cloud-based FIS, implying the significance of user's BI in cloud-based FIS services adoption. It is hence necessary for governments and CSPs to create positive cloud FIS intentions in end-users, through the use of tactics like mandatory awareness training programs and information provision to cloud-based FIS-related individuals to address potential resistivity against the CC technology, especially to those who work cloud-related jobs and need to be regularly updated on the recent advancements.

Additionally, government, businesses and CSPs need to come up with a long-term strategy to achieve performance reform and improvement and improve the services provided to clients in various sectors including the sector of accounting. Equally, government, businesses and CSPs need to improve their status to supersede their counterparts worldwide, via the provision of dependable and efficient administrative practices. Still, in developing countries particularly, government and businesses were still green in their use of state-of-the-art ICTs, and so, the findings of this study can become good direction to SMEs especially those in Jordan in their effective use of groundbreaking technologies like cloud computing to increase the performance of individuals particularly the staff of accounting department in SMEs.

From the results, TR was a significant BI determinant, demonstrating that the increase in trust of users in cloud-based services and CSPs will intensify the willingness of users to accept and use the services. Understanding of the advantages of cloud-

based FIS to its clients would significantly lead to a successful cloud immigration process. For this reason, SMEs must consistently improve their current systems and applications; make the systems more user-friendly and educate the staff on the measures of information security. Additionally, CSPs should be consistently aware of what concerns the users in their use of cloud-based services and take the necessary actions and increase the trust and security perceptions by making the staff, as users, aware of the measures currently in use.

In practice, this study highlights the characteristics of prominent threat and coping appraisal for cloud-based FIS practitioners, by, firstly, affirming that COVID-19 severity risk is a determinant of cloud-based FIS among practitioners. Operators of SME often have to frequently handle the payment counters and this puts them at a risk of being infected by the virus unknowingly from the infected customers, through physically close-proximity and cash-based transactions. On the other hand, customers may not have to encounter physical money exchanges as much as SME operators (merchants). In this regard, m-payment service providers might communicate such a type of close-contact risk and the likely harm from contact with contaminated banknotes.

8. Limitations and future work

With respect to the study limitations; firstly, being a cross-sectional study, this study did not show how BI of user can change with time, because this study presents BI of user within one time frame only. In order to understand the change that may occur, longitudinal study should be carried out. The second limitation of this study was its sole focus on cloud-based FIS. As such, the study's model could be used in future research on some other cloud-based systems to allow comparison of the distinct and comparable aspects - this will add to relevant literature. Thirdly, the data used in this study were obtained from SMEs in Jordan whose culture is distinct from that of SMEs in other countries, as such, this study should be replicated to SMEs in other cultures and countries to gain understanding of the effect of cultural differences on cloud-based FIS adoption. Lastly, considering the recentness of CC technology in Jordan, in accounting systems particularly, large-scale samples should be employed in forthcoming studies in order to make the samples more relevant to the entire target population, leading to better outcome generalization.

9. Conclusion

Cloud-based technology was scrutinized in this study using the UTAUT model with the inclusion of the variables of COVID-19 risk and trust, and the results presented a new outlook of such technology, particularly within the context of the accounting domain at the individual level. In fact, FIS has been an under-explored domain with respect to CC application despite its significance especially during crisis situations such as during COVID-19 pandemic within the Jordanian context. Indeed, cloud-based accounting services utilization in Jordan, particularly among SMEs has not been examined much. CC services have been used by organizations as a way to gain a competitive advantage or to remain relevant in the information industry. For SMEs, using online ICTs like cloud applications helps them to streamline the services delivery to businesses, clients and other stakeholders. Notably, cloud applications were most recently perceived as a life-sustaining instrument in management of crises like that of COVID-19 because this technology allows users to better their services delivery, and their cooperative and communications efforts (Al-Okaily et al., 2021a, 2021b). It appears that cloud applications are increasingly adopted in organizations, and yet, their acceptance and use at individual level have not been ascertained. As such, cloud-based FIS acceptance and use was examined in this study, focusing on individuals (i.e., demand-side).

References

Abu-Shanab, E. (2014). Antecedents of trust in e-government services: an empirical test in Jordan. *Transforming Government: People, Process and Policy, 8*(4), 480-499.

Adjei, J.K., Adams, S., & Mamattah, L. (2021). Cloud computing adoption in Ghana: accounting for institutional factors. *Technology in Society, 65*, 101583.

Ai Ping, T., & Al-Okaily, M. (2023a). Evaluation of Data Analytics-Oriented Business Intelligence Technology Effectiveness: An Enterprise-Level Analysis. *Business Process Management Journal*. Vol. and No. ahead-of-print. https://doi.org/10.1108/BPMJ-10-2022-0546.

Ai Ping, T., Al-Okaily, M., Iranmanesh, M., & Al-Betar, M. (2023b). The Efficiency Measurement of Business Intelligence Systems in the Big Data-Driven Economy: A Multidimensional Model. *Information Discovery and Delivery*. Vol. ahead-of-print No. ahead-of-print. https://doi.org/10.1108/IDD-01-2022-0008.

Aji, H.M., Berakon, I., & Md Husin, M. (2020). COVID-19 and e-wallet usage intention: a multigroup analysis between Indonesia and Malaysia. *Cogent Business and Management, 7*(1), 1804181.

Akter, S., Michael, K., Uddin, M.R., McCarthy, G., & Rahman, M. (2020). Transforming business using digital innovations: the application of AI, blockchain, cloud and data analytics. *Annals of Operations Research, 308*, 1-33.

Alalwan, A.A., Dwivedi, Y.K., & Rana, N.P. (2017). Factors influencing adoption of mobile banking by Jordanian bank customers: extending UTAUT2 with trust. *International Journal of Information Management, 37*(3), 99-110.

Alam, M.Z., Hoque, M.R., Hu, W., & Barua, Z. (2020). Factors influencing the adoption of mHealth services in a developing country: a patient-centric study. *International Journal of Information Management, 50*, 128-143.

Alam, M.Z., Hu, W., & Barua, Z. (2018). Using the UTAUT model to determine factors affecting acceptance and use of mobile health (mHealth) services in Bangladesh. *Journal of Studies in Social Sciences, 17*(2), 137-172.

Al-Azawei, A., & Alowayr, A. (2020). Predicting the intention to use and hedonic motivation for mobile learning: a comparative study in two Middle Eastern countries. *Technology in Society, 62*, 101325.

Al-Bashayreh, M., Almajali, D., Al-Okaily, M., & Al-Adwan, A. (2022). Evaluating electronic customer relationship management system success: the mediating role of customer satisfaction. *Sustainability, 14*(19), 12310.

Al-Fraihat, D., Al-Debei, M. M., & Al-Okaily, A. (2022). Factors Influencing the Decision to Utilize eTax Systems During the COVID-19 Pandemic: The Moderating Role of Anxiety of COVID-19 Infection. *International Journal of Electronic Government Research (IJEGR)*, *18*(1), 1-24.

Alhomdy, S., Thabit, F., Abdulrazzak, F.A.H., Haldorai, A., & Jagtap, S. (2021). The role of cloud computing technology: a savior to fight the lockdown in COVID 19 crisis, the benefits, characteristics and applications. *International Journal of Intelligent Networks, 2*, 166-174.

Al-Kofahi, M., Shiyyab, F.S. & Al-Okaily, A. (2023). Determinants of user satisfaction with financial information systems in the digital transformation era: insights from emerging markets. Global Knowledge, Memory and Communication, Vol. and No. ahead-of-print. https://doi.org/10.1108/GKMC-12-2022-0285.

Almajali, D., Al-Okaily, M., Barakat, S., Al-Zegaier, H., & Dahalin, Z.M. (2022). Students' Perceptions of the Sustainability of Distance Learning Systems in the Post-COVID-19: A Qualitative Perspective. *Sustainability, 14*(12), 7353. https://doi.org/10.3390/su14127353

Almajali, D.A., Majali, T.E., Al-Bashayreh, M.G., & Altamimi, A.M. (2023). Antecedents of acceptance model for e-procurement in Jordanian public shareholding firms. *Journal of Consumer Marketing, 40*(6), 663-684.

Almaqableh, L., Reddy, K., Pereira, V., Ramiah, V., Wallace, D., & Veron, J.F. (2022). An investigative study of links between terrorist attacks and cryptocurrency markets. *Journal of Business Research, 147*, 177-188.

Al-Okaily, M. (2022). Toward an integrated model for the antecedents and consequences of AIS usage at the organizational level. EuroMed Journal of Business. Vol. and No. ahead-of-print. https://doi.org/10.1108/EMJB-05-2022-0100.

Al-Okaily, M. (2023a). The influence of e-satisfaction on users' e-loyalty toward e-wallet payment apps: a mediated-moderated model. International Journal of Emerging Markets. Vol. and No. ahead-of-print. https://doi.org/10.1108/IJOEM-08-2022-1313

Al-Okaily, M. (2023b). Does AIS usage matter in SMEs performance? an empirical investigation under digital transformation revolution. Information Discovery and Delivery. Vol. and No. ahead-of-print. https://doi.org/10.1108/IDD-08-2022-0072.

Alqudah, H., Al-Qudah, A.A., Al-Qadi, N.S., Elrehail, H., & Al-Okaily, A. (2022). Does financial awareness increase the acceptance rate for financial inclusion? An empirical examination in the era of digital transformation, *Kybernetes*, Vol. and No. ahead-of-print. https://doi.org/10.1108/K-08-2021-0710.

Alsmadi, A. A., Shuhaiber, A., Alhawamdeh, L. N., Alghazzawi, R., & Al-Okaily, M. (2022). Twenty Years of Mobile Banking Services Development and Sustainability: A Bibliometric Analysis Overview (2000–2020). *Sustainability*, *14*(17), 10630.

Armbrust, M., Fox, A., Griffith, R., Joseph, A.D., Katz, R., Konwinski, A., Lee, G., Patterson, D., Rabkin, A., Stoica, I., & Zaharia, M. (2010). A view of cloud computing. *Communications of the ACM, 53*(4), 50-58.

Arpaci, I. (2017). Antecedents and consequences of cloud computing adoption in education to achieve knowledge management. *Computers in Human Behavior, 70*, 382-390.

Asatiani, A., Apte, U., Penttinen, E., Rönkkö, M., and Saarinen, T. (2019). Impact of accounting process characteristics on accounting outsourcing-comparison of users and non-users of cloud-based accounting information systems. *International Journal of Accounting Information Systems, 34,* 100419.

Bagozzi, R., & Yi, Y. (1988). On the Evaluation of Structural Evaluation Models. *Journal of the Academy of Marketing Science, 16*(1), 74-94.

Bany Mohammad, A., Al-Okaily, M., Al-Majali, M., & Masa'deh, R. E. (2022). Business Intelligence and Analytics (BIA) Usage in the Banking Industry Sector: An Application of the TOE Framework. *Journal of Open Innovation: Technology, Market, and Complexity, 8*(4), 189.

Bhatiasevi, V. (2016). An extended UTAUT model to explain the adoption of mobile banking. *Information Development, 32*(4), 799-814.

Carter, L., & Bélanger, F. (2005). The utilization of e-government services: citizen trust, innovation and acceptance factors. *Information Systems Journal, 15*(1), 5-25.

Chang, M.L., & Wu, W.Y. (2012). Revisiting perceived risk in the context of online shopping: an alternative perspective of decision-making styles. *Psychology and Marketing, 29*(5), 378-400.

Cleary, P., & Quinn, M. (2016). Intellectual capital and business performance: an exploratory study of the impact of cloud-based accounting and finance infrastructure. *Journal of Intellectual Capital, 17*(2), 255-278.

Daniel, J. (2011). *Sampling Essentials: Practical Guidelines for Making Sampling Choices*. Sage Publications.

Dimitriu, O., & Matei, M. (2014). A new paradigm for accounting through cloud computing. *Procedia Economics and Finance, 15*, 840-846.

Dwivedi, Y.K., Rana, N.P., Jeyaraj, A., Clement, M., & Williams, M.D. (2019). Re-examining the unified theory of acceptance and use of technology (UTAUT): towards a revised theoretical model. *Information Systems Frontiers, 21*(3), 719-734.

Dwivedi, Y.K., Shareef, M.A., Simintiras, A.C., Lal, B., & Weerakkody, V. (2016). A generalised adoption model for services: a cross-country comparison of mobile health (m-health). *Government Information Quarterly, 33*(1), 174-187.

Gardner, B. (2020, March 2). Dirty banknotes may be spreading the coronavirus, WHO suggests. The Telegraph. https://www.telegraph.co.uk/news/2020/03/02/exclusive-dirty-banknotesmay-spreading-coronavirus-world-health.

Godovykh, M., Pizam, A., & Bahja, F. (2021). Antecedents and outcomes of health risk perceptions in tourism, following the COVID-19 pandemic. *Tourism Review, 76*(4), 737-748.

Gupta, P., Seetharaman, A., & Raj, J.R. (2013). The usage and adoption of cloud computing by small and medium businesses. *International Journal of Information Management, 33*(5), 861-874.

Hair, J., Black, W., Babin, B., Anderson, R., & Tatham, R. (2010). *Multivariate Data Analysis*. (7th edition), New Jersey: Prentice-Hall.

Heshiki, Y., Dissanayake, T., Zheng, T., Kang, K., Yueqiong, N., Xu, Z., Sarkar, C., Woo, P. C. Y., Chow, B. K. C., Baker, D., Yan, A., Webster, C. J., Panagiotou, G., & Li, J. (2017). Toward a metagenomic understanding on the bacterial composition and resistome in Hong Kong banknotes. *Frontiers in Microbiology, 8*, 632. https://doi.org/10.3389/fmicb.2017.00632

Ibrahim, F., Ali, D.N.H., & Besar, N.S.A. (2020). Accounting information systems (FIS) in SMEs: towards an integrated framework. *International Journal of Asian Business and Information Management, 11*(2), 51-67.

JCI (2017). Jordan chamber of industry - industrial directory, available at: www.jci.org.jo/

Kakushadze, Z., & Liew, J.K.-S. (2020). Coronavirus: Case for Digital Money? *World Economics, 21*(1), 177-190.

Khayer, A., Talukder, M.S., Bao, Y., & Hossain, M.N. (2020). Cloud computing adoption and its impact on SMEs' performance for cloud supported operations: a dual-stage analytical approach. *Technology in Society, 60*, 101225.

Kim, C., Tao, W., Shin, N., & Kim, K.-S. (2010). An empirical study of customers' perceptions of security and trust in e-payment systems. *Electronic Commerce Research and Applications, 9*(1), 84-95.

Kramer, A., Schwebke, I., & Kampf, G. (2006). How long do nosocomial pathogens persist on inanimate surfaces? A systematic review. *BMC Infectious Diseases, 6*(1), 1-8.

Kurfalı, M., Arifoglu, A., Tokdemir, G., & Paçin, Y. (2017). Adoption of e-government services in Turkey. *Computers in Human Behavior, 66,* 168-178.

Kwok, Y.L.A., Gralton, J., & McLaws, M.L. (2015). Face touching: A frequent habit that has implications for hand hygiene. *American Journal of Infection Control, 43*(2), 112-114. https://doi.org/10.1016/j.ajic.2014.10.015.

Lallmahomed, M.Z.I., Lallmahomed, N., & Lallmahomed, G.M. (2017). Factors influencing the adoption of e-government services in Mauritius. *Telematics and Informatics, 34*(4), 57-72.

Le, X.C. (2022). The diffusion of mobile QR-code payment: an empirical evaluation for a pandemic. *Asia-Pacific Journal of Business Administration, 14*(4), 617-636.

Lian, J.-W. (2015). Critical factors for cloud based e-invoice service adoption in Taiwan: an empirical study. *International Journal of Information Management, 35*(1), 98-109.

Lu, M.P., & Kosim, Z. (2022). An empirical study to explore the influence of the COVID-19 crisis on consumers' behaviour towards cashless payment in Malaysia. *Journal of Financial Services Marketing*. https://doi.org/10.1057/s41264-022-00182-9.

Masa'deh, R. (2012). The impact of management information systems (MIS) on quality assurance (QA): a case study in Jordan. *International Journal of Information, Business and Management, 4*(2), 93-110.

Masa'deh, R., & Shannak, R. (2012). Intermediary effects of knowledge management strategy and learning orientation on strategic alignment and firm performance. *Research Journal of International Studies, 24*, 112-128.

Mell, P., & Grance, T. (2011). The NIST definition of cloud computing. In: National Institute of Standards and Technology.

MoDEE (2020). Cloud (platforms and services) policy 2020, available at: www.modee.gov.jo/ebv4.0/ root_storage/en/eb_list_page/cloudpolicy-2020-english.pdf

Moudud-Ul-Huq, S., Asaduzzaman, M., & Biswas, T. (2020). Role of cloud computing in global accounting information systems. *The Bottom Line, 33*(3), 231-250.

Pallant, J. (2005). SPSS Survival Manual: A Step Guide to Data Analysis Using SPSS for Windows Version 12. Chicago, Illinois: Open University Press.

Paquette, S., Jaeger, P.T., & Wilson, S.C. (2010). Identifying the security risks associated with governmental use of cloud computing. *Government Information Quarterly, 27*(3), 245-253, doi: 10.1016/j.giq.2010.01.002

Patil, P., Tamilmani, K., Rana, N.P., & Raghavan, V. (2020). Understanding consumer adoption of mobile payment in India: extending meta-UTAUT model with personal innovativeness, anxiety, trust, and grievance redressal. *International Journal of Information Management, 54,* 102144.

Pujazon, D., & Carr, B. (2020). Cloud computing: a vital enabler in times of disruption. The United States, available at: www.iif.com/Publications/ID/3978/Cloud-Computing-A-Vital-Enabler-in-Times-of-Disruption

Quintal, V.A., Lee, J.A., & Soutar, G.N. (2010). Risk, uncertainty and the theory of planned behavior: a tourism example. *Tourism Management, 31*(6), 797-805.

Ronaghi, M.H., & Forouharfar, A. (2020). A contextualized study of the usage of the internet of things (IoTs) in smart farming in a typical Middle Eastern country within the context of unified theory of acceptance and use of technology model (UTAUT). *Technology in Society, 63*, 101415.

Sastararuji, D., Hoonsopon, D., Pitchayadol, P., & Chiwamit, P. (2021). Cloud accounting adoption in small and medium enterprises: an integrated conceptual framework: five factors of determinant were identified by integrated Technology-

Organization-Environment (TOE) framework, diffusion of innovation (DOI), institutional theory (INT) and extended factors. Paper presented at the 2nd International Conference on Industrial Engineering and Industrial Management, Barcelona.
Sekaran, U., & Bougie, R. (2013). *Research Methods for Business: A Skill-Building Approach*, 6th edition, New York: Wiley.
Shareef, M.A., Dwivedi, Y.K., Kumar, V., & Kumar, U. (2017). Content design of advertisement for consumer exposure: mobile marketing through short messaging service. *International Journal of Information Management, 37*(4), 257-268.
Sharma, S.K., Al-Badi, A., Rana, N.P., & Al-Azizi, L. (2018). Mobile applications in government services (mG-App) from user's perspectives: a predictive modelling approach. *Government Information Quarterly, 35*(4), 557-568.
Sharma, V., You, I., Andersson, K., Palmieri, F., Rehmani, M.H., & Lim, J. (2020). Security, privacy and trust for smart mobile-internet of things (M-IoT): a survey. *IEEE Access, 8*, 167123-167163.
Shin, D.-H. (2013). User centric cloud service model in public sectors: policy implications of cloud services. *Government Information Quarterly, 30*(2), 194-203.
Singh, R.P., Haleem, A., Javaid, M., Kataria, R., & Singhal, S. (2021). Cloud computing in solving problems of COVID-19 pandemic. *Journal of Industrial Integration and Management, 6*(2), 209-219.
Singh, R.P., Javaid, M., Haleem, A., & Suman, R. (2020). Internet of things (IoT) applications to fight against COVID-19 pandemic. *Diabetes and Metabolic Syndrome: Clinical Research and Reviews, 14*(4), 521-524.
Singh, S., Jeong, Y.-S., & Park, J.H. (2016). A survey on cloud computing security: issues, threats, and solutions. *Journal of Network and Computer Applications, 75*, 200-222, doi: 10.1016/j. jnca.2016.09.002.
Son, H., Park, Y., Kim, C., & Chou, J.-S. (2012). Toward an understanding of construction professionals' acceptance of mobile computing devices in South Korea: an extension of the technology acceptance model. *Automation in Construction, 28*, 82-90.
Song, C-H., Kim, S.W., & Sohn, Y-W. (2020). Acceptance of public cloud storage services in South Korea: a multi-group analysis. *International Journal of Information Management, 51*, 102035.
Sreelakshmi, C.C., & Prathap, S.K. (2020). Continuance adoption of mobile-based payments in Covid-19 context: an integrated framework of health belief model and expectation confirmation model. *International Journal of Pervasive Computing and Communications, 16*(4), 351-369. https://doi.org/10.1108/IJPCC-06-2020-0069
Sultan, N. (2014). Making use of cloud computing for healthcare provision: opportunities and challenges. *International Journal of Information Management, 34*(2), 177-184.
Sultana, J. (2020). Determining the factors that affect the uses of mobile cloud learning (MCL) platform blackboard-a modification of the UTAUT model. *Education and Information Technologies, 25*(1), 223-238.
Tamele, B., Zamora-Pérez, A., Litardi, C., Howes, J., Steinmann, E., & Todt, D. (2021). Catch me (if you can): assessing the risk of SARS-CoV-2 transmission via euro cash (2021/259; Occasional Paper Series). http://dx.doi.org/10.2139/ssrn.3896131
Venkatesh, V., & Zhang, X. (2010). Unified theory of acceptance and use of technology: US vs China. *Journal of Global Information Technology Management, 13*(1), 5-27.
Venkatesh, V., Morris, M.G., Davis, G.B., & Davis, F.D. (2003). User acceptance of information technology: toward a unified view. *MIS Quarterly, 27*(3), 425-478.
Venkatesh, V., Thong, J.Y.L., & Xu, X. (2012). Consumer acceptance and use of information technology: extending the unified theory of acceptance and use of technology. *MIS Quarterly, 36*(1), 157-178.
Yau-Yeung, D., Yigitbasioglu, O., & Green, P. (2020). Cloud accounting risks and mitigation strategies: evidence from Australia. *Accounting Forum, 44*(4), 421-446.
Zissis, D., & Lekkas, D. (2011). Securing e-government and e-voting with an open cloud computing architecture. *Government Information Quarterly, 28*(2), 239-251.
Zissis, D., & Lekkas, D. (2012). Addressing cloud computing security issues. *Future Generation Computer Systems, 28*(3), 583-592, doi: 10.1016/j.future.2010.12.006.