

The Role of Cloud Computing on the Governmental Units Performance and E-Participation (Empirical Study)

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Abstract

Cloud computing is an effective technology for businesses and government sections to enhance their performance. In many modern countries adoption of cloud computing improves its success in reducing the costs with high level of e-services offered to citizens. However, many developing countries are still reluctant to adopt cloud computing and received very little empirical support. This study reviews the literature of this domain and builds a model to examine the main drivers that help decision makers in adoption of cloud technology with e-government sectors. Based on a sample of 326 respondents data analyzed using the Structural Equation Modelling through Smart Partial Least Squares technique. The study revealed that mobility, cost, backup & disaster recovery, scalability & flexibility are the key drivers that significantly affect employees' intention to adopt cloud computing for governmental units which in turn positively influence the effectiveness of e-participation

Keywords: Cloud computing, E-government, E-participation, Scalability, Mobility, Backup & Disaster recovery.

1 Introduction

Cloud computing encompasses the use of remote servers with the built-in capability and efficiency in storing, processing and remitting data to the designated users [9]. Ali and Osmanaj [7] pointed that cloud technology has the ability to improve the reliability and scalability of organizational systems which in turns leads to an enhanced focus on core business tasks and achieving their strategy goals. Al-Sharafi et al. [12] illustrate that cloud computing emerged from the continuous advancements of the information and communication technology (ICT). Also, Ferreira and Moreira [16] narrates that ICT has faced a significant level of progress based on the success rates of the software and hardware systems. Therefore, cloud computing emerged as a stemmed up architecture to the old technologies in business premises and government systems. As such, it offers various types of services as well as online applications focused on the services such as the commonly model, 'pay-as-you-go'.

Researchers such as Mell and Grance [27] have defined cloud computing as a new advanced state of ICT that capitalizes on remote servers to manage, store and dispense the customised or personalized soft information to the specific users. Harfoushi et al. [21] consider cloud computing as the newest adventure in healthcare and other business centers with higher level of flexibility and reliability. Besides, Oliveira et al. [34] consider cloud computing with more a myriad of benefits to the business organization. They indicate that cloud technology is necessary for all business organizations that need to keep with the fast changing technological sectors. However, utilizing such technology may be done through a complex framework that should consider many technical issues [8]. In developed nations, all citizens get the access to the national services using the handset devices, thereby incorporating an all-inclusive citizens' participation [27]. Further analysis by Abu-Shanab [1] considers cloud computing as a technology that involves a rapid transmission of the processed data from the soft stores to the cloud.

E-government and e-participation are two intertwined aspects of online interaction. Al-Quraan and Abu-Shanab [10] define e-government as "...an extension of traditional government that supports conducting all related transactions electronically" (p. 325). On the other side, the same authors consider e-participation as the use of any electronic device to take part in the national political and developmental matters. In essence, e-government gives and creates the room for e-participation. By using the mobile electronic gadgets, citizens gain access to the online government services and also contribute to the economic and political proceedings. In more comprehensive terms, Dash and Pani [15] refer to e-Government as the use of (ICT) to advance the nature of their service delivery and to attain effectiveness, democracy and integrity within their functionalities.

The major importance of cloud computing is the shared environment that enhances the services delivery over the internet for businesses as well as for government sectors. Such active and digital environment can effectively motivate the cloud provides to offer an attractive alternative for the citizen and customers to transact online [37]. Moreover, this research considers cloud computing to be an improved version of the traditional ICT with many advantages over the latter. Apart from the low cost of maintenance, cloud computing is also much easier to scale according to the organizational requirement compares to the traditional ICT system [41]. Also, cloud computing is more flexible in terms of the number of users, organizational roles among other aspects [2]. On the same point, Gital and Zambuk [18] point out that cloud computing has superior features over the traditional ICT by 'driving down cost while fostering innovation and promoting agility' (p. 364). However, despite the good features that are offered by cloud computing, still in some developing countries as Jordan, many sectors are reluctant to adopt it. Therefore, this research focuses on identifying the various factors that expedite or impede the adoption of cloud computing by the Jordanian e-government and its possible impact on its performance through increasing the online services which potentially increase the levels of individuals' e-participation. The remaining sections of this article are structured as follows: section 2 reviews the related work. Section 3 presents the research model and hypotheses development. Section 4 introduces the research method. Section 5 illustrates the results and discussion followed by research recommendations and implications in section 6. Finally, section 7 outlines key conclusions, limitations and future work followed by references.

2 Related Work

Ali and Osmanaj [7] conducted an empirical study designed to develop a cloud regulations model to assist governments in adopting cloud computing services. Khayer et al. [24] suggested a model to study the main factors that affect the decision to adopt cloud computing

in small and medium enterprises. Their study reveals that relative advantage, service quality, perceived risks, top management supports, facilitating conditions, cloud providers influence, server location, computer self-efficacy, and resistance to change have a significant effect on the adoption of cloud computing. Also, their study confirms the positive impact of cloud computing adoption on firm performance.

Amron, et. Al. [13] conducted an empirical research to study the relevant factors that affect the acceptance of cloud computing implementation in organizations. Results of their study suggest a new context for cloud computing adoption for businesses. Akar and Mardiyani [5] have listed several factors that affect the adoption of cloud computing within Turkey. The two scholars recognized cost, customization, level of need, performance of the technological platform, and security among other factors. Other researchers such as Joshi et al. [23] have also spotted a gap in the framework of the cloud computing service delivery as one of the critical factors that modulate the complete adoption of the cloud computing within the government and other business facilities. In response, Joshi et al. [23] proposed a sophisticated framework, which they termed as 'government-to-government' for an improved and safer information transfer.

Wahsh and Dhillon [40] presented a vast history about the adoption of the cloud in the e-government of Malaysia. Such studies present numerous advantages and benefits of using the cloud in the national governance systems. Cloud facilitates and expedites economic, social and political development in both the developing and developed countries. Cloud is highly beneficial to the current national governance systems since it provides the chance of owning safer ICT initiatives and strategies that give them the opportunity to put "plenty of information online, automating administrative processes, procedures, and interacting with citizens, businesses and employees through online services" [22]. Wahsh and Dhillon [40] recognized that cloud enhances public sector organizations since it decreases the cost of using information technology services. Therefore, the cloud has great roles in improving the performance of the government.

Zissis and Lekkas [42] argued that cloud computing enhances the service delivery particularly when it is effectively integrated within the e-government, thereby facilitating e-participation. The adoption of the cloud in the governance systems transforms the operations of the government into an online platform where citizens and foreign investors can freely interact and access the services of their preference.

Through such online interactions, several benefits around the adoption of cloud computing arise. Alsanea [11] argued that cloud computing empowers and improves the performance of the government in the domain of prompt online service delivery. On the same point, Mohammed et al. [30] named a benefit that ranges from low costs of adoption to improved transparency. Also, cloud adoption improves accountability of the government officials, proves appealing platform of interaction by the citizens, among other accountability issues. Such benefits arise due to the level of openness with which the major national transactions are conducted, witnessed by the citizens.

Zissis and Lekkas [42] also indicate that cloud improves the level of accuracy in the information transfer since the online systems work in an automated manner. Therefore, there are several benefits to support the decision of any government to adopt the current cloud computing services. In essence, such benefits form the central factors upon which the hypothesis of this study develops. Moreover, Al-Dwairi et al. [6] argued that cloud computing as a new IT capability can solve many problems to small and medium enterprises (SME) in terms of cost, technology, and availability. In their research, results show that need,

cost, security, and reliability are major factors that affect cloud computing adoption in SMEs in Jordan.

Some researchers including Sulehat and Taib [38] have observed that some developing nations have not fully utilized the current ICT of cloud computing. Such observation points towards the possibility of noteworthy hurdles against the movement towards such adoption. However, despite the documented barriers [6], some developed nations are in the implementation stages of cloud computing in the e-government sector. Okezie et al. [33] recognized that the assessment, trial, and implementation of the cloud are currently active in several governments across the globe. Interestingly, the highly technologically developed business sectors, as well as the advanced governance systems, have adopted the cloud with an array of benefits. Some of the benefits that lure most organizations include the lower costs of installation, higher levels of security, flexibility, and automatic data recovery [17].

3 Research Model and Hypotheses Development

The theoretical framework of this study focuses on the Technology Organizational and Environmental model (TOE). According to the Diffusion of Innovation (DOI) theory, several factors lead to the uptake of advanced technologies. The TOE framework, therefore, elaborates the technological, organizational and environmental factors that may affect the utilization of new technology [26]. High performance, flexibility, low pricing, ubiquity, reliability, and dynamic scalability are notable features of cloud computing. These have been noted to enhance the implementation of an E-government and therefore eliminating low-performance flaws such as difficulty in business collaborations, high IT budgets, security and limited utilization of resources. Assigning more value to these factors has been noted to increase their uptake by public organizations [40].

The value of data security, cost and complexity, strategic competence and senior leadership support has been quoted in most scholarly literature ref. However, IT managers and system engineers mainly focus on compatibility of cloud services with infrastructural capabilities and policies of the organization. Additionally, business requirements, environment and relative advantages are also critical in implementation of cloud-based E-governments. Fig. 1 shows the research model of this study.

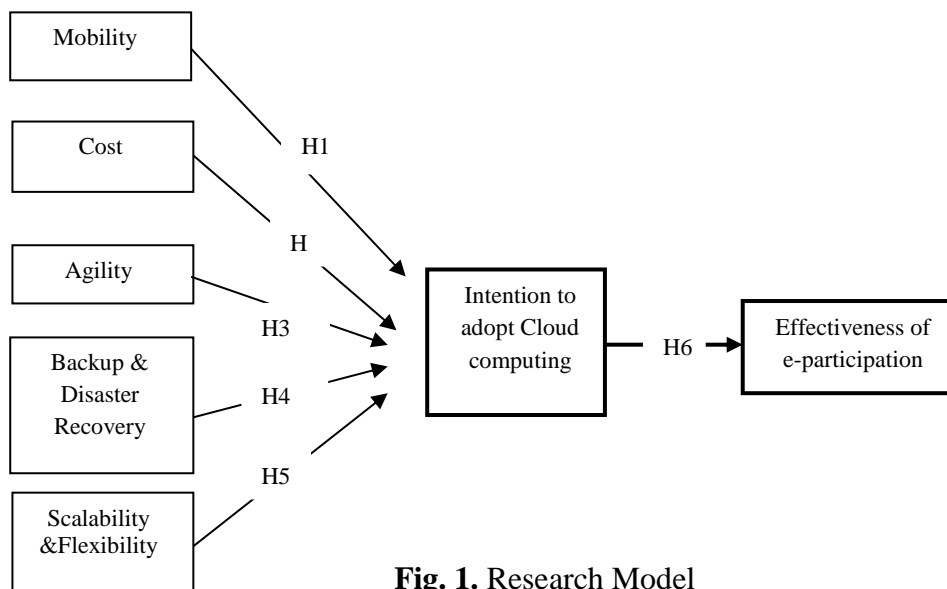


Fig. 1. Research Model

3.1 Research model and variables

The effectiveness of e-participation accrues on the mobility of cloud computing and the ease with which the government adopts it. Mobility encompasses the transferability and thus the effective use of the cloud computing. Whereas technology is rapidly growing to accommodate the mobility needs, some aspects of cloud computing still hinder the successful adoption of mobile cloud computing, especially within the e-government. Nguyen et. al [32] posit that the mobile cloud only works effectively under the reinforcements of the 'small-world networks'. Nevertheless, with full access to the mobile devices, then the e-government finds it more viable, convenient and appropriate for adoption. As such, the users would have the freedom and all the convenience to access the e-government services from all locations. Abu-Shanab and Haider [3] illustrate that m-government has an array of advantages that directly benefit the aspect of e-participation.

The mobility of technology and access to services are integral parts of an effective m-government with a well-fitted cloud computing system. Similarly, Dash and Pani [15] indicate that mobile cloud computing also recommends the installation of specific software, already tested. Such mobility gives a chance to all citizens with internet devices, regardless of their areas. Consequently, the number of participants would increase with the incorporation of cloud computing in the e-government. Based on this information, we address the following hypothesis:

H1: mobility has a significant positive impact on adoption of cloud computing in e-government

The financial capability of the government largely contributes to the adoption of cloud computing. Akar and Mardiyani [5] conducted a survey in Turkey to address the various factors that affect the adoption of cloud computing in the e-government. The researchers assert that cloud computing requires fewer finances and thus little economic planning before approval since the process of adoption is less expensive than the traditional technologies. And so, it becomes easier for the named government to adopt the cloud computing in their systems. The low costs also imply the small financial requirements for acquiring internet gadgets. Therefore, most citizens can access online services and participate effectively. Additionally, the Wahsh and Dhillon [40] surveyed in Malaysia to determine the various factors that affect the adoption of cloud computing in the e-government and their report highlighted cost as one of the major players of the decision regarding the adoption of cloud computing. Another report published by Alsanea [11] indicates the lower costs of incorporating cloud computing strengthens public participation in political matters. According to Alsanea [11], most governmental institutions are rushing to adopt and utilize cloud computing as a means of reducing the IT maintenance costs. Based on this information, we address the following hypothesis:

H2: cost has a significant positive impact on adoption of cloud computing in e-government

Agility ensures swiftness in the e-government services to cater to the needs of the citizens. In such a way, the agility of the cloud computing limits time wastage for accessing the allocation of the national resources. As a result, all the citizens will have ample access to real-time and updated services and resources [43]. The citizens need up-to-date services in a continuously flowing manner for effective participation. Such demands get achieved through effective utilization of cloud computing. The suppleness of cloud computing contributes to the effective functioning of commercial activities, e-commerce thereby

ensuring the effective participation of the citizens. According to Mircea and Andreescu [28], the educational centers and research institutions critically require the input of cloud computing to enhance the agility of their operations. Based on this information, we address the following hypothesis:

H3: Agility has a significant positive impact on adoption of cloud computing in e-government

The vast data storages require backups as well as active recovery systems [11]. Whereas Mohammed and Ibrahim [29] look at data storage as a negative implication of the cloud computing, Dash and Pani [15] considers the cloud computing as an independent body with dynamic capabilities of maintaining its data. Therefore, according to [15], the e-participants do not need to consider the challenges of data recovery as a hurdle to their contributions on the online national agendas. Besides, the provider of cloud computing services has the responsibility to monitor the data for any leakage, attack, and malware. Additionally, certain service sources can auto check their security protocols thereby giving the participants and assurance of their data and information security. Dash and Pani [15] still recommend the use of cloud computing by citing the advantage that it has the inherent ability to recover internal errors. Such capabilities encourage the citizens to participate more effectively on the e-government matters. The same idea is supported by Alsanea [11] who mentions that cloud computing is reliable due to its ability to recover from the internal errors. Based on this information, we address the following hypothesis:

H4: backup and disaster recovery have a significant positive impact on adoption of cloud computing in e-government

The scalability of cloud computing gives it an advantageous ability to handle varying loads of server data [23]. The ability to expand and accommodate larger data values gives cloud computing a better choice as an effective enhancer of a larger number of public participants. Besides, the number of e-participants can be expanded, called up and down in the system without additional cost requirements. The ability to scale the server loads also gives cloud computing competencies to adjust for the security measures and plans of names institution or government body. Finally, the flexibility of the cloud computing makes it easy to minimize wastages since the usage gets modulated according to the level of need [37]. Hence, we address the following hypothesis:

H5: flexibility and scalability have a significant positive impact on adoption of cloud computing in e-government

Cloud computing in the e-government enhances e-participation in many ways. Kumar et al. [25, p. 171] indicate that "e-governance is a way to achieve good governance through ICT to have better citizen participation". Also, they argued that cloud computing has many positive attributes that lure and enhance active public participation. For example, the transparency with which information is shared between the citizens and the government agencies encourages more participants to contribute their ideas. Moreover, the automation of the e-government functionalities empowers the public to take part in the national agenda more effectively. Besides, the active public participation is not only promoted by the automated services but also by the ease of accessing such services. The research done by Joshi et al. [23] identifies that a specific framework within cloud computing can also elevate public participation. Based on this information, we address the following hypothesis:

H6: cloud computing has a significant positive impact on effectiveness of e-participation

4 Research Methodology

This research aims to investigate determinants of employee's intentions to adopt cloud computing for E-government in public sector. As intentions have been considered as significant determinant for actual use and participation in different theories and models such as Theory of Planned Behavior [4] and Unified Theory of Acceptance and Use of Technology by [39], therefore, the present study was designed to explore and investigate factors that determine intentions among employees who operate in the public sector, accordingly, exploratory approach using quantitative method was adopted as recommended by Neuman [31].

4.1 Instrument Development

As a quantitative research, a questionnaire was designed with structured close ended questions to be self-administrated by respondents to avoid any interruption from researcher side; moreover, questionnaire instructions were included clearly in the first page with explanation for the study purposes. Instrument was designed to include four sections as following: First section: included demographic occupation through gender, age, educational level, years of working in IT field, and finally the name of ministry or department respondent currently works in. Different categories were provided, and respondents were required to check one of the provided options. The study developed an instrument based on items used for previously researched constructs as shown in Table (2). Considering that these items were adopted from English literature and the study was to be conducted in Arabic context, items were translated to Arabic language. All these items that measure determinants, intentions and effectiveness of participation have five options of agreement as (5→Strongly agree, 4→Agree, 3→Neutral, 2→Disagree, 1→Strongly disagree), indicating the use of 5-Points Likert Scale which is one of the most widely used scales [36]. After developing instrument and before proceeding with data collection, validity and reliability of the instrument need to be confirmed. According to Babbie [14] validity is about instrument ability to adequately reflect the desired meaning of specific concept which can be validated through different means. Firstly, considering that instrument items were adopted for prior literature that was tested in ample of works in different contexts, this confirms content validity. Second, face validity of the instrument was confirmed through asking number of experts in the field E-government and intentions to measure instrument items in term of its ability to measure what is intended to be measured and language exactness, with major agreement on instrument validity expect minor modifications in language and phrasing were requested. Reliability represents instrument power to provide same adequate results when reused in similar settings [14], with different means available to confirm instrument reliability. Therefore, pilot study was conducted and (15) questionnaire were distributed to IT students and teachers for any comments on questionnaire items, therefore minor modifications were required regarding instructions clarity and number of language phrases. After confirming validity and reliability of the instrument, then data was collected. For this, (344) questionnaires were distributed on employees in different governmental offices in Jordan. (339) questionnaires were retrieved making (98%) response ratio. Response ratio was very high as researcher distributed each questionnaire to each respondent and give full time till respondent finish; therefore, most of the questionnaires were retrieved. After collecting required data questionnaire were verified for statistical analysis validity, and (13) questionnaires were excluded as identified invalid for statistical analysis or missing more than (25%) of the data, and final sample included (326) respondents were used in analysis. Table 1 shows the descriptive statistics of the respondent's profile.

Table 1: Respondent Profile

Variable	Category	Freq.	Percent
Gender	Male	210	64.8%
	Female	114	35%
	Missing	2	.6%
	Total	326	100%
Age	18 – 29 years	65	19.9%
	30 – 39 years	201	61.7%
	40 years or more	56	17.2%
	Missing	4	1.2%
	Total	326	100%
Education	Diploma or less	15	4.6%
	Bachelor	293	89.9%
	Master	18	5.5%
	Ph.D.	--	--
	Missing	--	--
	Total	326	100%
Experience in IT field	2 years or less	34	10.4%
	3 – 5 years	134	41.1%
	6 – 10 years	111	34%
	More than 10 years	45	13.8%
	Missing	2	.6%
	Total	326	100%

5 Results and Discussion

The statistical validity and reliability of the measurement need to be confirmed through different proposed methods. Cronbach's α values along with [CR] Composite Reliability values was suggested to exceed (0.70) to confirm reliability as suggested by Hair et al. [19], which was confirmed as summarized in table 2 as all Cronbach's α and CR values was seen to exceed (0.70) and achieve high values indicating high reliability.

Table 2: Measurement items loading and significance

Dimension	Item	AVE	Cronbach's α / [CR]	Loading	(T)
Mobility	Mobility_1	0.619	0.813/ 0.830	0.755	60.483
	Mobility_2			0.783	51.122
	Mobility_3			0.822	38.537
Cost	Cost_1	0.625	0.893/ 0.893	0.762	36.726
	Cost_2			0.782	43.850
	Cost_3			0.855	48.250
	Cost_4			0.724	30.077
	Cost_5			0.824	34.906
Agility	Agility_1	0.700	0.923/ 0.921	0.829	42.087
	Agility_2			0.787	63.303
	Agility_3			0.856	62.672
	Agility_4			0.805	74.775

	Agility_5			0.902	28.005
Backup and disaster recovery	Backup_2	0.566	0.839/ 0.839	0.710	28.433
	Backup_3			0.791	50.654
	Backup_4			0.742	22.132
	Backup_5			0.764	32.801
Scalability and flexibility	Scalability_1	0.619	0.866/ 0.866	0.825	55.288
	Scalability_2			0.809	46.644
	Scalability_3			0.761	38.539
	Scalability_4			0.749	45.921
Intention to adopt cloud computing	Intentions_1	0.734	0.892/ 0.892	0.851	64.215
	Intentions_2			0.884	70.463
	Intentions_3			0.835	50.658
Effectiveness of participation	Part_Effectiv_1	0.756	0.926/ 0.925	0.895	58.690
	Part_Effectiv_2			0.845	56.818
	Part_Effectiv_3			0.875	80.007
	Part_Effectiv_4			0.862	70.656

Validity was confirmed through convergent validity that examines Average Variance Extracted [AVE] which measures the captured variance of specific dimension in relation to the variance of measurement model error, as Hair et al. [19] suggested that AVE values need to exceed (0.50) to confirm good convergent validity. Finally, regarding discriminant validity that measures whether two dimensions that supposed to be unrelated (is related or not). Hair et al. [19] suggested confirming Fornell-Larcker validity which PLS provides to confirm discriminant validity of the model, which was achieved and confirmed as summarized in table 3.

Table 3: Discriminant validity

	1	2	3	4	5	6	7
Agility	0.837						
Backup and disaster Recovery	0.747	0.753					
Cost	0.749	0.754	0.791				
Effectiveness of participation	0.611	0.661	0.674	0.870			
Intentions to adopt cloud Computing	0.561	0.621	0.678	0.519	0.857		
Mobility	0.721	0.746	0.855	0.633	0.740	0.787	
Scalability and flexibility	0.487	0.459	0.637	0.453	0.561	0.656	0.787

Structural Equation Modelling (SEM) though Smart Partial Least Squares (PLS) was selected to conduct analysis process, as SEM in general has emerged as powerful method due to the high predicting power and capabilities that allow for testing complex paths [19][20]. Analyzing through SEM-PLS requires confirming number of assumptions with data, in order to provide reliable results. These assumptions require checking for normality and multicollinearity conditions. In this study, normality was confirmed through Skewness and Kurtosis values. Skewness represents the extent to which data distribution have differences form the default normal distribution. Kurtosis represents the extent to which data-tail could be light or heavy when comparing to normal distribution. Skewness and Kurtosis have different recommended values according to the selected analysis techniques and considering that present study will employ SEM-PLS.

Table 4: Skewness and Kurtosis values

Variable	Skewness	Kurtosis
Mobility	-1.103	2.38
Cost	-1.019	1.78
Agility	-.774	.620
Backup and disaster recovery	-.555	.144
Scalability and flexibility	-.295	.666
Intentions to adopt cloud computing	.388	-1.205
Effectiveness of E-participation	-.553	.436

Furthermore, multicollinearity assumption is required in case of different dimensions of the independent variable which can be confirmed through different tests. Pallant [35] suggested using of Bivariate Pearson correlation as correlation value that exceed (0.90) represent high collinearity between the two dimensions and these dimensions represent one concept, therefore using Pearson correlation to check multicollinearity between independent variable dimensions requires significant correlation values and recommended to not exceed (0.70) to ensure that no multicollinearity issue. Table 5 summarize Person correlation that reported significant correlations at 2-tailed level (0.01) and less than the recommended level (0.70) for majority of dimensions except one value which was (0.730) exceeding recommended level slightly but less than (0.90), therefore multicollinearity assumption was confirmed through this test.

Table 5: Pearson Correlation Values (N=326)

Dimensions	1	2	3	4	5
Mobility	1				
Cost	.730**	1			
Agility	.611**	.683**	1		
Backup and disaster recovery	.614**	.659**	.642**	1	
Scalability and flexibility	.507**	.507**	.367**	.356**	1

Testing structural model requires path testing through examining coefficient of determination (R²) which represent the amount of variance that independent variables explain in the dependent variable, and path coefficient (β) that represent the influence of each determinant and finally the significance of each path coefficient at (0.05) level through (T) statistics which needs to exceed (1.96) to achieve significance as suggested by [19]. Figure 2 provides path testing and significance.

Following path testing process, the five proposed determinants achieved (0.571) variance in sample intentions to adopt cloud computing. It can be stated that the proposed determinants explained (R² = 57.1%) of sample intentions to adopt cloud computing, which is moderate variance. Moreover, mobility was identified as the strongest driver for intentions as achieved the highest significant path coefficient was [$\beta = 0.313$, T = 4.288] and this confirm the first

hypotheses stating that “H1: Mobility will positively influence employee intentions to adopt cloud computing for E-government”. Whereas, cost determinant was identified as the second strongest significant determinant as path coefficient was [$\beta = 0.171$, $T = 2.282$] and this confirms the second hypotheses stating that “H2: Cost will positively influence employee intentions to adopt cloud computing for E-government”. Agility was identified as insignificant determinant as path coefficient was [$\beta = 0.029$, $T = 0.427$], hence the third hypotheses stating that “H3: Agility will positively influence employee intentions to adopt cloud computing for E-government” is rejected. Backup and disaster recovery, scalability and flexibility determinants were seen also as significant determinants and achieved same variance as path coefficient was [$\beta = 0.152$, $T = 2.393$] and [$\beta = 0.151$, $T = 3.064$] respectively therefore, confirming the two hypotheses stating that “H4: Backup and disaster recovery will positively influence employee intentions to adopt cloud computing for E-government” and “H5: Scalability and flexibility will positively influence employee intentions to adopt cloud computing for E-government” respectively.

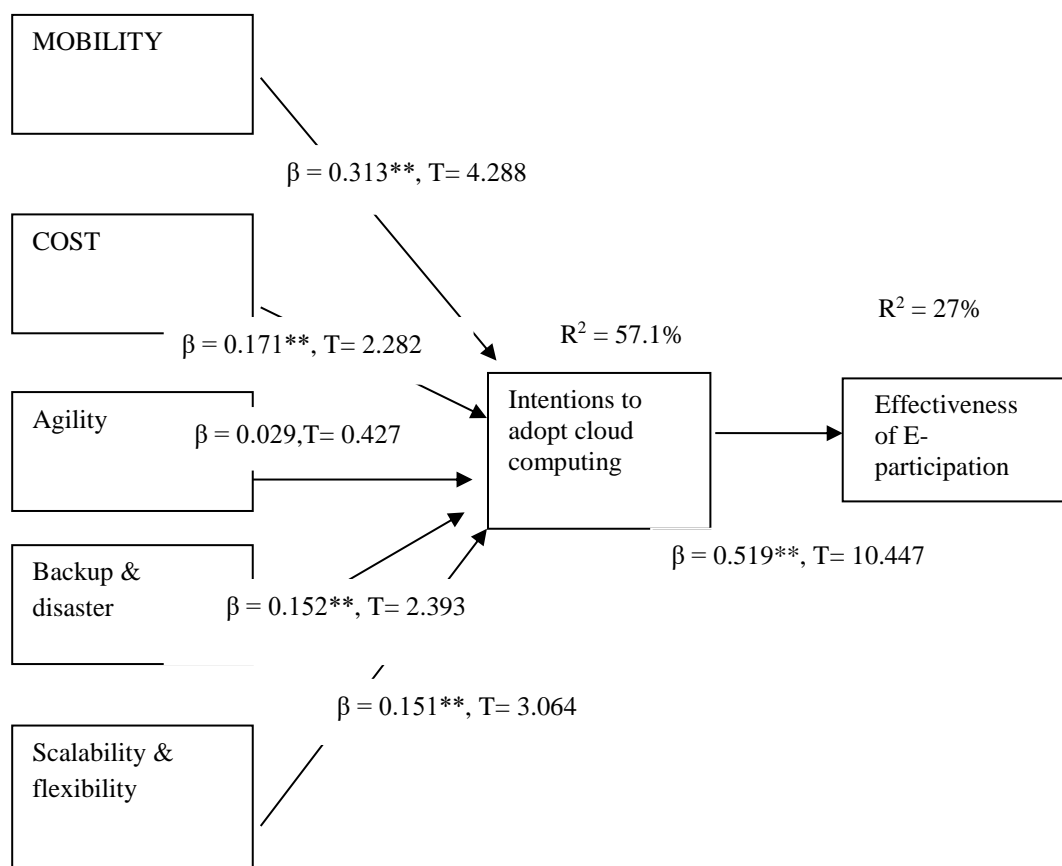


Fig. 2. Path testing and significance

Therefore, it can be stated that mobility, cost, backup and disaster recovery, scalability and flexibility are significant determinants for employee intentions to adopt cloud computing, as the extent to which employees believe that cloud computing could provide such benefits, this would influence their intentions positively to adopt, however, in contrary to expectation agility was identified as insignificant determinant for current sample, which is in contradict with result by SlaibiAlsharafat et al.[43] and Joshi et. al [23]. This could be explained by apprehensions among the sample to adopt this technology regarding agility options, as even they reported high believing toward agility capabilities that such technology would provide, however, these believes wasn't enough to influence their intentions

positively, as they still may have other concerns and apprehension toward some perspectives regarding agility in accomplishing work tasks through cloud computing, as despite they perceive adopting cloud computing technology may enhance agility in some areas, however they may perceive it will result in other consequences, therefore, this indicate an issue need to be addressed adequately from those employees perspective, to address their concerns.

Finally, regarding the hypothesis that stating that “H6: Employee intentions to adopt cloud computing for E-government will positively influence their effectiveness of E-participation”, confirmation for the hypothesis was provided as the path between intentions to adopt cloud computing and effectiveness of E-participation was significant as [$\beta = 0.519$, $T = 10.447$], moreover, achieved variance recorded (0.270). Indicating that intentions explained ($R^2 = 27\%$) of the variance, and therefore, it can be stated that intentions successfully predicted low to moderate variance in effectiveness of E-participation and this in line with result by Joshi et al. [23].

6 Research Implications and Recommendations

Moreover, present study addressed these determinants from employees perceptive, however its vital also to address the concern of top management, as literature have also pointed different obstacles might stem for management and technology (Ali et al. , 2021) that can result in adoption failure despite employees have good intentions to adopt and participate. Providing employees with workshops and training courses is also recommended, to foster their effectiveness of participation and attitudes toward adopting could computing, and to avoid any conflict during transforming to cloud computing. Reveling final study results, different implications can be provided: Employees have high awareness and positive intentions toward adopting could computing, which would be opportune to continue the process of integrating it to E-government within public sector. Despite employees having high awareness toward cloud computing benefits, it's recommended to provide them with more workshops explaining cloud computing related issues, to ensure higher awareness. Results reported that employees' perceptions toward cloud computing agility capabilities were insignificant to influence their intentions; this indicate the need of more workshop and training to get employees familiar with agility capabilities. Employees responses is considered as a valuable feedback for governmental units top managers for adopting of cloud computing to offer more s-services to citizens and hence improve level of citizens e-participation and be ready to deal with unexpected problems as Covid 19.

7 Conclusions, Limitations and Future Work

The main objective of this study is to explore the main factors that affect government sections to adopt cloud computing to enhance their performance and offer a rich technological environment for customers and individuals to increase the level of their online transactions via e-participation. Government agencies and units are still reluctant to adopt such technology. In essence there is a shortage of studies that addresses such title. Hence, many reasons for such behavior are not yet known. In response, this study suggested a model for adoption of cloud technology in government sections by addressing many factors that are related to this technological environment and empirically tested it. Results shows that Mobility, Cost, Scalability and flexibility and , Backup and disaster recovery are the drivers that significantly have positive effect on government employees intention to adopt cloud computing. Conducting present study, different limitations were identified, firstly, present study results are survey-based, and therefore, the confidence of results mainly depends on

sample confidence. Second, Present study adopted quantitative method only, whereas qualitative method is well known with its ability to capture more details, therefore future studies are recommended to adopted methodology triangulation, to provide more comprehensive view.

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