Understanding determinants of cloud computing adoption:
A review of technology adoption models

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ABSTRACT

The adoption and usage of cloud computing have become a competitive weapon for achieving organizational or business sustainability and maintaining a strategic position in a marketplace or in the eyes of its clients, even though it has been facing various impediments as a result of inadequate understanding of appropriate models to be applied and the users' perception of CCA. Consequently, this study aims to investigate and analyze the current state of the literature on cloud computing adoption (CCA) with various technology adoption models in different areas. However, inappropriate models could not explain the factors determining the adoption determinants and little research attention has been paid to the adoption of cloud computing. For this reason, a systematic literature review (SLR) with a total of 204 and 40 (samples) articles were employed. The four. The findings of the study revealed that the TOE was the most adopted adoption model, followed by the DOI model. This study also identified 23 determinants of CCA that have been extracted from these four models as significant factors determining the adoption of cloud computing. Out of these determinants, security and privacy (SP) were found as the most dominant factors influencing CCA. SME is the major area where CCA has been used, especially from the year 2015 to 2020. There is a need to invest more in ICT in other sectors of the economy.

INTRODUCTION

The quickest growing digital revolution is providing businesses with previously unheard-of chances to boost performance through improved operational efficiency (Vu et al., 2020), greater customer service (Tella et al., 2020), market expansion (Lawan et al., 2020), and innovation. In order to take advantage of these prospects, businesses need to have digital infrastructure and skills. Cloud computing is hosted on the Internet rather than a user's actual machine. The information kept in the cloud is accessible from anywhere, at any time (24/7). There are only a select few factors that affect the adoption of cloud computing (Hajizadeh & Navimipour, 2017; Aharony 2015; Low and Chen 2011; Maqueira-Marin, Bruque-Camara & Minguela-Rata, 2017). However, companies may find it expensive and ineffective to create these competencies in-house (Alvarez et al., 2022; Senyo et al. 2018; Lynn et al., 2020). Therefore, it is essential to build a solid cloud service knowledge of the factors that influence business and non-business sectors' cloud computing adoption in a variety of developmental and geographic situations. However, the determinants that influence or prevent the adoption of an acceptable model or theory may be best explained by the CCA that results in poor comprehension (Sabi, Ukoza, Langmia, & Njeh, 2015). According to Aharony (2015), there is a sizable body of work on cloud computing that makes use of diverse technological adoption models in various economic sectors. But there are also quite a few similar problems with selecting an inappropriate or uncommon model or theory that cannot adequately explain the crucial elements of the CCA. The factors affecting the CCA are little discussed in the literature. The use of cloud computing in education and other fields has received minimal study attention, which has an impact on how contextual variables might affect the acceptance and dissemination of cloud computing (Sabi et al., 2015).

LITERATURE REVIEW

Regarding acceptance, the notion of CCA is a new phenomenon in fields including small and medium-sized businesses (SMEs), business, education, as well as private and governmental organisations. According to Low and Chen (2011), a type of computer application service known as cloud computing makes use of ubiquitous resources that may be shared by business associates or trade partners and includes services like e-mail, office software, and enterprise resource planning. In addition, cloud computing was defined by Gangwar, Date, and Ramaswamy (2015) as a method for delivering information technology (IT) enabled services in the form of software, platforms, and infrastructure through the Internet.

Software as a Service (SaaS), Platform as a Service (PaaS), and Infrastructure as a Service (IaaS) are the three main service models used in cloud computing (Gangwar et al., 2015). The notion of software as a product has been replaced by that of services as a result of the advent of software as a service (Gangwar et al., 2015). Additionally, there are four fundamental deployment methods for cloud computing, including public, private, hybrid, and community clouds. As suggested by the name, the public cloud offers services to everyone. In contrast, the private cloud offers better and more secure services than the public cloud does, but only to a small group of private persons and organisations (Gangwar et al., 2015). Cloud service companies like IBM, Amazon, and Google Cloud, among others, can provide computer services (Senyo, Effah, and Addae, 2016). A new paradigm for organisational operations and procedures is provided by switching from an organization's current practise to cloud computing, where software, platforms, and infrastructure are provided as services rather than goods (Ramchand et al., 2021; Ramchand et al., 2021).

Technology adoption models

Technology organization and environment (TOE)

The majority of organisational tasks are now automated, and information is available 24/7 from anywhere and anytime thanks to technology. As a result, the spread of technology-enabled devices, programmes, and apps as well as the Internet causes an organisational turnaround classified as part of the technological dimension (TD). Only under TD were relative benefits, compatibility, and complexity seen (Ahmad and Waheed 2015).

Table 1: Proposed technology adoption models

Theory/Model	Acronyms	Developed by
Technology, Organization & Environment	TOE	Tornatzky and Fleisher (1990)
Technology Acceptance Model	TAM	Davis, (1989)
Unified Theory of Acceptance & Use of Technology	UTAUT	Venkatesh et al. (2003)
Diffusion of Innovation Theory	DOI	Rogers (1962)

Technology Dimension (TD): The ability of technology, organisational factors, and environmental factors all play a role in how certain public organisations' IT departments use cloud computing. Consequently, the Technology-Organization-Environment (TOE) model by Tornatzky and Fleischer will be modified in this study due to its applicability in including the three variables (1990). *Relative Advantage (RA):* According to Rogers (1983), relative advantage refers to the extent to which technical aspects are viewed as being more advantageous for businesses. *Compatibility (COM):* The degree to which an invention is compatible with the values, customs, and requirements of the potential adopter (Rogers 1983; Vu, Hartly, & Kankalli, 2020). **Organizational Dimension (OD):** An organization's dimension is all the assistance provided by the top management team, employees, and size of both human and non-human resources that work together to accomplish the intended goals. *Organization Size (OS)*: In this context, the prior study revealed that a firm's attribute size was significant. Additionally, the outcome suggests that one of the factors affecting CCA is business size (Senyo et al. 2016). *Organization Objectives (OOs):* OOs are the projected goals and objectives that an organisation hopes to accomplish at the time cloud computing is adopted and successfully used (Amron et al., 2019). *Top Management Support:* The phrase "top management support" (TMS) refers to any assistance leading to the reengineering of processes and the integration of resources, which will be a significant factor in determining CCA. **Environmental Dimension (EO):** Therefore, providers of cloud services must ensure a high degree of security from all types of external threats. The cloud providers and their respective clients have to come to a firm and mutual agreement (Rad & Rana, 2017). *Competitive Pressure (CP):* For the purposes of this study, "CP" refers to the outside force that compels an organization to adopt new, current, and developing technologies in order to satisfy the demands of stakeholders (Tahir et al., 2015). *Concerned Parties Pressure (CPP):* With regard to this study, the CPP refers to the middle and high-level management's (internally) and clients' (outside service beneficiaries') pressure to make it difficult to access some services, which will lead many clients to accept the process innovation for efficient service delivery. *Regulatory Support (RS):* Senarathna et al. (2018) defined RS as the government regulations that regulate the affairs and usage of a certain technology and either encourage or dissuade people to utilize it appropriately or to avoid it.

Technology Acceptance Model (TAM) original and modified The TAM is a socio-technical paradigm that seeks to explain user acceptance of an information system, in accordance with Devis (1989). It comes from the Theory of Reasoned Action (TRA, Fishbein and Ajzen, 1975), which describes how individuals want to behave in a certain way. Devis (1989) stated that "an individual's views, attitudes, and intention might be understood as their adoption of technology."**Unified Theory of Technology Acceptance and Use (UTAUT)** One of the most current models for evaluating the factors that influence technology adoption was developed by Venkatesh, Morris, Davis, and Davis (2003). Bakkabulindi (2014), however, emphasises that the UTAUT paradigm falls short when compared to the TOE and IDT. While not all inventions are technological, the UTAUT was found guilty of prejudice toward technology adoption (Rogers, 2003 as sighted in Bakkabulindi, 2014). Khayer et al. (2019) found that performance expectation, effort expectancy, absorptive capacity, data security, and privacy, and perceived trust were the most important determinants of CCA.**Theory of diffusion of innovation** Rogers created the DOI hypothesis in 1962. Top management support, organisational readiness, and technology readiness are some examples of organisational DOI variables. The environmental DOI variables, which also include competitive pressure, regulatory support, and many more, have recently gained popularity among researchers (Abdullahi et al., 2021; Awa et al., 2016; Damali et al., 2021; Mohamed & Anter, 2018; Shahzad et al., 2018).. The determinants of CCA, however, could not be explained by using a poor model. As a result, little is understood about the elements influencing the uptake and use of cloud computing.

OBJECTIVES

The goals of this study are to: investigate the current state of the literature on the most common adoption model of cloud computing; identify the critical factors that influence adoption; look into the sectors that adopt cloud computing most frequently; and examine the distribution of studies on cloud computing adoption over time. Additionally, the current study concentrated on identifying and assessing the important factors influencing the CCA using data from the various literatures.

METHODS

The results have been presented as charts, tables, and figures using the descriptive statistics. It was especially useful for aspiring researchers since it gave them a simple method to understand how the data on a particular topic was carefully handled for analysis. This research approach was based on SLR, and it used measured investigation to extract some facts from that information.

Design

This employed a systematic literature review (SLR). Moreover, the study employed various techniques such as Boolean operator (see Data Collection Procedures Section) and inclusion and exclusion criteria (see Table 2).

Secondary data source

A total of 204 articles were sourced, of which n = 204 were recruited for screening and evaluation, n = 164 were rejected because they didn't fulfil the criteria for reliability and validity (Chophel, 2022), and only n = 40 passed the test. N = 40 articles were therefore utilized as research samples (Ibidunni et al., 2021). Initially, about 693 articles total were retrieved for this study from different databases.
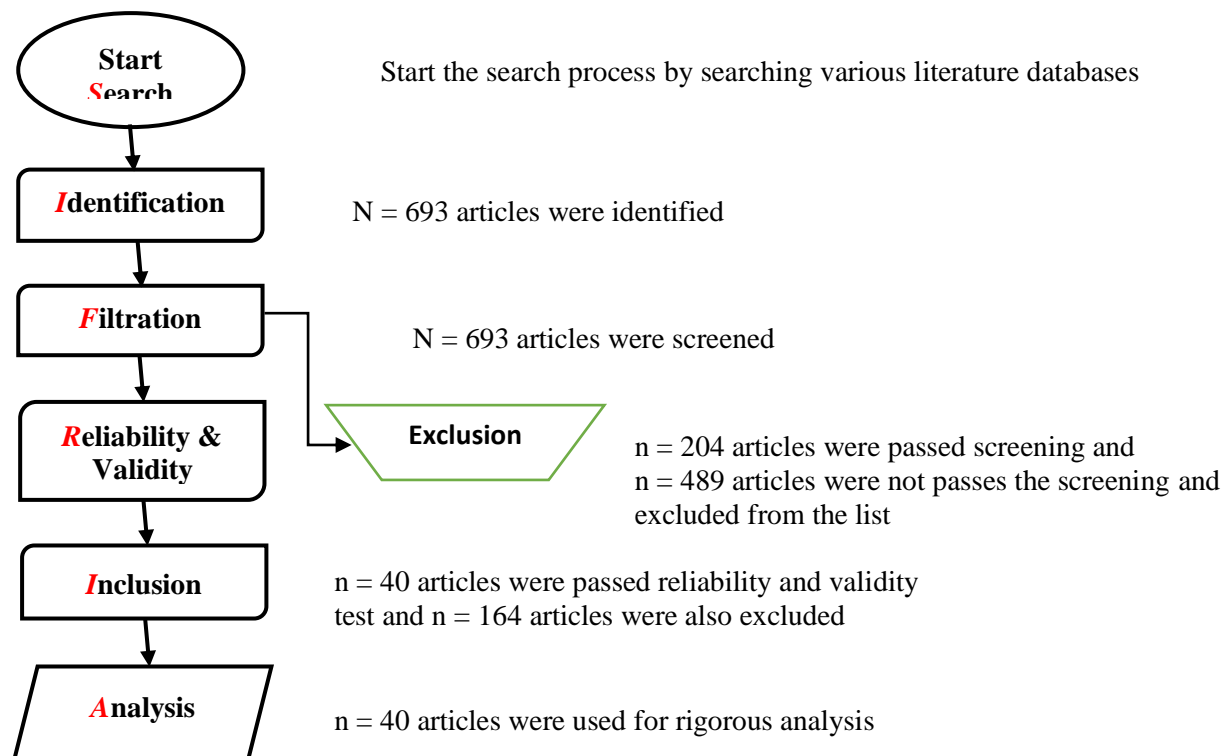

Figure 1. SIFRIA flow chart adapted from (Ahmed et al., 2022)

Table 2. Inclusion and Exclusion Criteria

Inclusion Criteria	Exclusion Criteria
Include relevant articles from the year 2016 to 2020	Exclude irrelevant articles below 2016
Add literature related to CCA	Exclude literature not related to CCA
Add articles from reputable journal or conferences databases	Exclude all articles that are not from reputable journals or conferences databases

Ethical considerations

In order to give sufficient information appropriate for this study, the researchers made sure that the earlier studies in the form of articles or conferences and their contents were considered for the review based on the titles, abstracts, keywords, and primary contents. Additionally, all of the sources consulted for this study were acknowledged in accordance with research ethics.

Data collection

After the data were carefully examined, 204 papers were chosen with 40 articles as sample size of the study. However, based on the major determinants (factors) of CCA with regard to title, keywords, abstracts, and entire contents of the articles. Research Gate, Science direct, Emerald, IEEE, Google Scholar, Springer, and conference proceedings were used to acquire the research data. Other sources included top journals and conference proceedings. The stories we've chosen to highlight were released between 2015 and 2020. Boolean search operators using title as the key, including AND, OR, and mixed. Cloud computing AND Adoption (Determinants) and (Factors Influencing AND Adoption (Cloud computing)) are the first steps in the process (Amron et al., 2019; Kim et al., 2022; Jie et al., 2021). The study includes abstracts and keywords as well.

Table 3. Prior Studies on CCA based on theories/models, sectors and determinants

S/N	Authors/Year/Tittle	Model/Theory Sample & Methodology	Sector, Participant & Country Applied	Adoption Determinants
1	Lawan, Oduoza C.F, Buckley K., (2020) Proposing a conceptual model for CCA in Upstream oil and gas sector	Technology, Organization, Environment (TOE), Institutional Theory, & Diffusion Innovation Theory (DOI)	Oil & Gas Industry, IS users	• Technological characteristics, • Organizational context • Environmental context as well as • Social & Political influence
2	Tella, Ukwoma and Kayode, (2020) A Two models modification for determining CCA for web-based service in academic libraries in Nigeria	Unified Theory and Use of Technology (UTAUT), & Technology Adoption Model (TAM) Survey sample of 105 Librarians, Quantitative research design, SEM	Education, 9 Universities Libraries, Southwestern Nigeria	The best predictors (determinants): • Perceived Security and • Perceived Reliability Others include: • Facilitating condition, • Perceived benefits, • User friendliness, • Perceived ease of use, • Ease of maintenance • Perceived Flexibility

No.	Study	Method	Context	Findings
				• Explained 73% factors of CCA
3	Abu Khayer, Nusrat Jahan, Md. Nahin Hossain (2019) The adoption of cloud computing in SMEs: A developing country perspective	UTAUT & TOE, Survey sample of 373 Managers & SMEs' owners Quantitative research design SEM	SMEs SMEs' owners & Managers only Bangladesh	• Performance Expectancy, • Effort Expectancy, • Absorptive Capacity, • Data Security & Privacy
4	Njenga, Garg, Bhardwaj, Prakash & Bawa, (2018) The CCAin higher learning institutions in KenyaL Hindering factors and Recommendations for the way forward	TOE Online survey Survey sample of 69 higher institutions Quantitative research design Cronbach's alpha, Analysis of variance (ANOVA), & Regression analysis	Education IT leaders Kenya	• Training from cloud services providers • Government policy • Reliability from cloud service providers • Data security
5	Sabi, Uzoka, Langmia and Njeh, (2016) Conceptualizing a model for adoption of cloud in education	DOI & TAM Online survey (Email) Survey sample of 30 people SEM	Education Sub-Saharan Africa	
6	Jianwen and Wakil, (2019). A model for evaluating the vital factors affecting CCA. Analysis of the services sector	TOE Survey sample of 108 employees & Managers SEM	Health International hospitals IS users	• Human factor • Organizational factor • Technical factor
7	Alkhter, Walters, and Wills, (2017) An empirical study of factors influencing CCA among private sector organizations	TOE & DOI Survey sample of 300 IT staff Qualitative research	Private sectors (Organizations) IT staff Saudi Arabia	Strongest determinants: • Quality of service • Trues • Security & Privacy • Compliance with regulation • Physical location
8	(Hassan, 2017). Organisational factors affecting cloud computing adoption in small and medium enterprises (SMEs) in service sector	TOE & DOI 643 questionnaires distributed, 140 completed	SMEs Malaysia	• Top management support • Employee's Knowledge • IT Resources

9	Asiaei and Rahim, (2019) A multifaceted framework for adoption of cloud computing in Malaysian SMEs	TOE & DOI Survey sample of 209 employees SEM	SMEs SMEs' Employees Malaysia	• Data security • Technology readiness • Top management support • Competitive pressure • Innovativeness
10	Kumar, Samalia, and Verma, (2017) Exploring suitability of cloud computing for SMEs in India	TOE, Survey sample of 121 SMEs, Factor analysis & Multiple regression analysis	Manufacturing Industry, IS users, India	• Perceived benefits • Top management support • Competitive Pressure • Perceived concerns
11	Senyo et al, (2016) Preliminary insight into CCA in a developing country	TOE, Survey sample of 305 organizations SEM & Logistic regression analysis	Service Industry (Clubs, Registered Stock Exchange & Multinational companies), IS users Ghana	• Relative advantage • Security concern • Top management support • Technology readiness • Competitive pressure • Trading partners' support
12	Gangwar, Date and Ramaswamy, (2015) Understanding determinants of CCA using an integrated TAM-TOE	TAM & TOE Survey sample of 280 companies SEM	IT, Manufacturing & Financial sectors IS users India	• Relative advantage • Compatibility • Complexity • Organizational readiness • Top management commitment • Training & Education
13	Aharony (2015) An factors affecting the adoption cloud computing by Information professionals	TAM Survey sample of 700 Librarians Cronchbach's Alpha	Education (Libraries) Librarians & IS users Israel	• Perceived ease of use • Personal innovativeness • Threat & Challenges • Self-efficiency • Openness to experience • Computer competence
14	Anabel Guitierrez Elias Boukrami Ronald Lumsden, (2015) TOE factors influencing managers' decision to adopt CC in the UK	TOE, 257 sample, Principal Analysis & Logistic Regression	Organizations, Mid-to-Senior level Managers & IT Professionals, United Kingdom	The most strongest determinant • Trading partner pressure Others include • Competitive pressure • Complexity • Technology readiness
15	Doherty (2015) Examining the drivers & barriers to ACC by SMEs in Ireland: An exploratory	Online data collection	SMEs	•

	study	1500 samples,	Ireland	
16	Yikai Liang at el., (2017) Exploring the determinant & influence mechanism of E-government CA in government agencies in China	Grounded Theory (GT) 18 provincials & 59 municipals governments, ATLAS for data analysis	Government China	• Technology driving • Cloud providers' support • Environment stimulus • Organizational readiness • Cloud trust
17	Alharbi, Atkins, and Stanier, (2016) understanding of determinants of CCA in Saudi Healthcare organizations	TOE, IS Triangle, HOT-fit, 354 samples, Chronbach'a Alpha	Health, Managers & IS users, Saudia Arabia	• Soft financial analysis • Relative advantage • Hard financial analysis • Attitude toward change & pressure from partners
18	Lynn, Fox, Gourinovitch and Rosati, (2020). Understanding the determinants of CCA for HPC	DOI, HOT-fit 619 samples EFA	Organization Managers & IS user Saudi Arabia	• Indirect benefits, • Adequate resources, • Top management Support • compatibility
19	Raza et al., (2015) The Slow Adoption of Cloud Computing and IT Workforce	Interview	IT Professionals	• Cost saving • Need for cloud computing • Mobility • Regulatory body • Security • Reliability
20	Anggraini & Legowo (2019) Cloud Computing Adoption Strategic Planning Using ROCCA and TOGAF 9.2: A Study in Government Agency	A case study	Upstream Oil and Gas	• Technology readiness • Relative advantages
21	Salim Alismaila atel., (2015) A multi-perspective approach for Australian SMEs	Quantitative Research design	SMEs Australia	• Security • Cost Saving or Service costs • Privacy
22	Adane (2018) CCA: Strategies for Sub-sahara Africa SMEs for enhancing competitiveness	Mixed method 261 samples		•
23	Al-Dwarir, Al-Tweit & Zyout, (2018) Factors influencing CCA in SME-commerce enterprises in Jordan	Conceptual framework 16 managers	SME Jordan	• Need • Cost • Security • Reliability
24	Elaheh et al., (2017) Predicting the cloud-based technology using Fuzzy Analytic Hierarchy process & SEM approaches	UTAUT SEM & Fuzzy Analytic Hierarchy process (FAHP)	Education Undergraduate Students	• Performance expectancy • Effort expectancy • Social Influence • Personalization

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		150 samples	Malaysia	
25	Yoo, and Kim (2019) The effectives factors of CCA success in organization		Organization	• Environmental factors
26	Hassan, Herry, Khairudin and Adon, (2017) Factors influencing CCA in SMEs	TOE	SMEs Malaysia	• IT resources • External pressure
27	Sharma, Al-Badi, Govindaluri and Al-Kharusi, (2016) Predicting motivators of CCA: A developing country perspectives	TAM 101 samples Multi Linear Regression MLR) & Neural Network (NN) modelling RMSE	SMEs IT Professionals Oman	• Computer-self efficiency • Perceived usefulness • Trust • Perceived ease of use • Job opportunity
28	Arpaci (2016) Antecedents & consequences of CCA in education to achieve knowledge management	TAM 221 samples SEM	Education Undergraduate students Turkey	• Perceived usefulness • Innovativeness • Training & education
29	Raut, Gardas, Jha & Priyadashinee, (2017) Examining the critical success factors of CCA in Micro-SMEs	SEM Multi Criteria decision making (MCDM), MICMAC		• Previous technological experience
30	Priyadarshinee, Raut, Jha Gardas, (2017) Understanding & predicting the determinants of CCA: A two staged hybrid SEM_Neural Networks Approach	TOE 660 samples SEM	SMEs Managers	• Perceived IT security risk • Risk analysis • Technology innovation • Management style • Trust
31	Mansouri et al., (2020) Simulation Modelling Practice and Theory Cloud computing simulators : A comprehensive review	Review	SMEs	• Relative Advantage • Top management support • Prior experiences • External computing support
32	Chhonker, M. S., Verma, D. & Kar, A. K. (2017) Review of technology adoption frameworks in commerce	TOE 209 samples SEM	SMEs Malaysia	• Data security • Technology readiness • Top management support • Competitive pressure • Innovativeness
33	Sahid, Maleh, and Belaissaoui, (2020) Cloud computing as a Drive for Strategic Agility in Organizations.		Business managers, IT professional and academicians	• IS performance • Organizational capabilities
34	Kandil, Ragheb, Ragab and Farouk (2020) Examining the effect of TOE model on CCA in Egypt	TOE SEM	IT department Employees Egypt	

35	Skafi, Yunis and Zekri, (2020) Factors influencing SMEs ACC services in Lebonon: An empirical analysis using TOE & Conceptual Theory	TOE & Conceptual Theory 139 samples Logistic Regression	SMEs IS users Lebanon	Technological factors • Complexity • Security Organization factors • Top management support • Prior IT experience
36	Bello et al., (2020) Automation in Construction Cloud computing in construction industry : Use cases , benefits and challenges	92 publications from 2009 to 2019		• Relative advantage • Top management support
37	Senarathna, et al., (2018) Factors that influence ACC: An empirical study of Australian SMEs	TOE 149 samples Multiple Regression	SMEs Australia	• Relative advantage • Quality of Service • Awareness • Security • Privacy • Flexibility
38	Maqueira-Marin, et al.,(2017) Environment determinants in business ACC	281 samples	Service IT users	• Technology providers • Success cases
39	Chhonker et al. (2017) Perception of CC in developing countries: A case study of Indian academic libraries	Conceptual model 339 samples	Education Library professionals India	• Ubiquitous availability • Economic & • Various resources
	Hassan, Mohd Nasir, Khairudin, (2017) CCA in organizations: Review of Empirical Literature	TOE N= 352 articles n = 9 articles samples		• CP, TMS, OS, COM, RA, were found significant on CCA. • Both Regulatory support, perceived legal uncertainty were not significant

Data analysis

SLR was utilised to assess the secondary data, and Microsoft Excel was used to quantify the results in the form of charts and tables to display descriptive statistics like frequency and percentage.

RESULTS

The study's results identified the TOE, DOI, TAM, and UTAUT as the top four technology adoption models. According to the study's findings, with reference to CCA, DOI and TAM were the next most popular technology adoption models, followed by TOE. This study demonstrates that UTAUT and TAM did not adequately identify and explain the primary elements that cause CCA (see, figure 2). As a result, researchers used combination models the least. The findings of this investigation and earlier studies are consistent. Due to the fact that it is the model that most effectively explains the factors that determine CCA based on the three (3) dimensions of technology, organization, and environment (Altwaijiry, 2020; Baral, 2021; Damali et al., 2021; Low & Chen, 2011; Senarathna et al. 2018; Yanz Alshamaila Savvas Papagiannidid Feng Li, 2013; Kandil, Ragheb, Farouk, 2020) and many more (see Table 3).
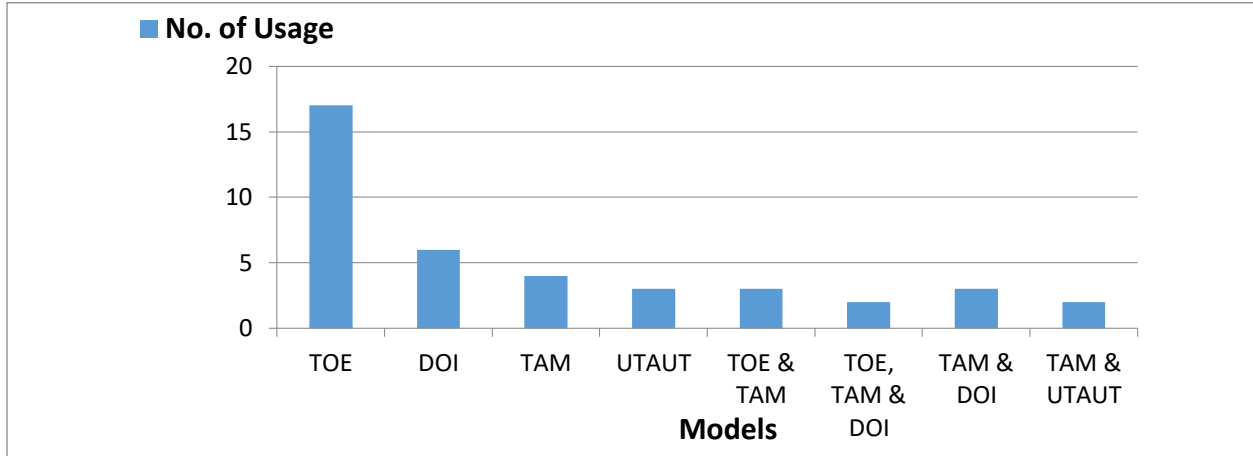
Figure 2. Technology Adoption Models (Models/Frameworks)

Figure 3, shows that 23 distinct adoption factors were identified based on the study's findings, and they came from the TOE, TAM, DOI, and UTAUT technology adoption models, alone or in combination. The results of this study showed that security and privacy are the most important predictors that should be taken into account for CCA because they have the highest frequency of 15 (10.5 percent), which is supported by research from (Tella, et al., 2020; Alkhter, et al., 2017; Oliveira, et al., 2014; Senyo, et al., 2016; Skafi, et al., 2020; and Low and Chen, 2011), 14 (9.8 percent) (Altwaijiry, 2020; Senyo, et al. 2016; Asiaei, et al. 2019), 12 (8.4 percent) (Ali, et al. 2018, Altwaijiry, 2020; Baral, 2021; Damali, et al., 2021), and 10 (10.1 percent) (Ali, et al., 2018; Altwaijiry (7.0 percent) Senyo et al., 2016), 9 (6.3%) (Ali et al., 2018; Altwaijiry, 2020; Baral, 2021; Damali et al., 2021), and 8 (5.6%) (Ali et al., 2018; Skafi et al., 2020), respectively.

*CM=Compatibility, *CX=Complexity, *RA=Relative Advantage, *SP=Security & Privacy, *TR=Technology Readiness, *TMS=Top Management Support, *TPP=Trading Partners Pressure, *OR=Organizational Readiness, *CP=Competitive Pressure, *TPS=Trading Partners Support, *SZ=Size, *SC=Scope, *INN=Innovativeness, *RB=Reliability, *RS=Regulatory Support, *ITPE=IT Prior Experience, *PE=Performance Expectancy, *EE=Effort Expectancy, *FC=Facilitating Condition, *SI=Social Influence, * PEOU=Perceived Ease of Use and *PU=Perceived Usefulness.
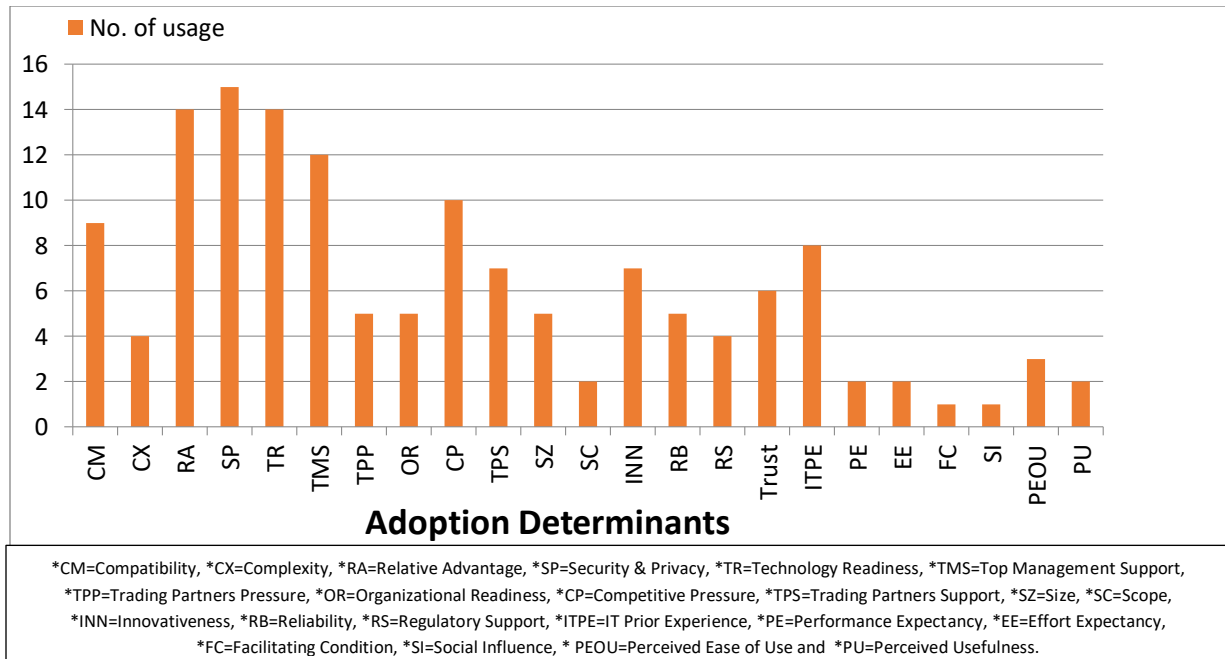
Figure 3. Adoption determinants

According to the study's findings (see Figure 4), small and medium-sized businesses are the industry in which cloud computing technology is used the most frequently (SMEs). According to the study's findings, SMEs made up the majority of the 24 (60%) sectors that were used for CCA using the TOE as a technology adoption model (Baral, 2021; Tella et al., 2020; Skafi, et al., 2020; Abu Khayer et al., 2019; Asaei and Rahim, 2019: see, table 2 in

appendix), followed by the education sector (7%) (18%) (Aharony, 2015 (e.g. e-Gov., e-Voting etc.) According to Alharbi et al. (2016), the health sector made up the least amount of these, 2 (5%) followed by unspecified sectors, which made up 4 (10%) of all the sectors (Kumar, et al., 2017). This finding indicates that, out of these four well-known industries, SMEs were the one seeing the quickest growth. It also demonstrates how one of the worldwide economic trends is toward SMEs.
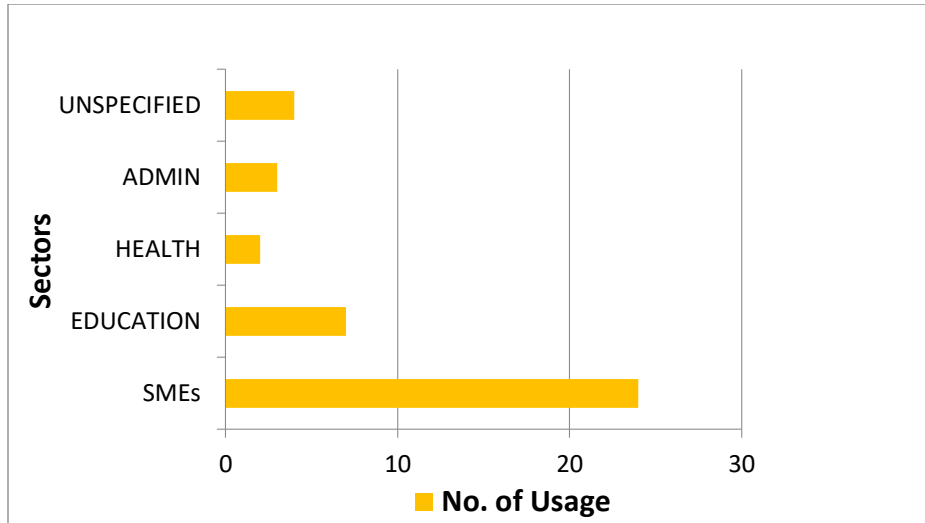

Figure 4. Popular Sectors investigated by prior studies on CCA

From 2015 to 2020, the distribution and utilisation of CCA models were taken into account (6 years). Ten (25%) were recorded in 2017, eight (20%) in 2016, six (15%) in 2015, six (15%) in 2018, and four (10%) in 2019. The CCA years of 2017 and 2016 were used in a variety of economic areas. However, the use of cloud computing in these industries decreased between 2017 and 2020. Additionally, according to the study's findings (see Figure 5), 2019 was identified as the year with the lowest investment in cloud computing.
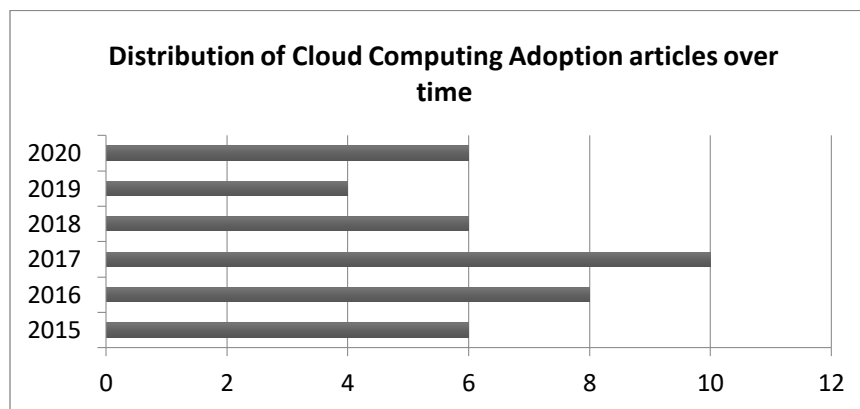

Figure 5. Distribution of articles

DISCUSSIONS

In comparison to DOI, TAM, and UTAUT, the study's findings showed that the TOE model and its contributing factors had the most impact on the adoption of cloud computing. Unlike TAM and UTAUT, which put greater emphasis on technology, behavioural intention, and usage (see Figure 2). It was discovered that the most important factors influencing and impeding the adoption of cloud computing were security and privacy, relative advantages, technological preparedness, top management support, and competitive pressure. Compatibility, IT prior knowledge,

assistance from trading partners' support, inventiveness were seen as the middle-level aspects that determine CCA (see Figure 3). The findings of this study also revealed that the SMEs was predominant sector where cloud computing penetrates most compared to Administration, Health, Education and others (unspecified from the consulted literature). This shows that there is huge investment in ICT particularly cloud computing in private sector where SMEs are owned and control by private individual not by the governments in most country (see Figure 4). The availability of literature on CCA was measured based on the number of studies published from the year 2015 to 2020. Hence, Figure 5 shows that 2017 is the year in which the study of cloud computing adoption penetrated most.

IMPLICATIONS

The adoption of cloud computing is influenced by a number of factors, including top management support, competitive pressure, and worries about security and privacy (CCA). In order to help potential researchers and organizations who wish to use cloud computing services for their daily operations, this study emphasizes some of the key factors influencing and inhibiting its adoption. The level of cloud computing usage was higher among SMEs. This will serve as evidence for the government to unveil the benefits that could be driven from the adoption and use of cloud computing services to other sectors, particularly the public for administrative work.

CONCLUSIONS

The factors influencing the CCA in various economic sectors were investigated in this study. It also referenced writings on the uptake of technology. The sector in which CCA has spread the greatest is SMEs. Within the parameters of this study, the most CCA research was conducted in the years 2016 and 2020. The TOE model has the largest influence on the adoption of cloud computing. Unlike TAM and UTAUT, which place more of an emphasis on technology, TOE takes into account organizations, the environment, and many elements of technology (see Figure 4). Therefore, figure 5 shows that 2017 is the year that the study of cloud computing adoption penetrated the most, followed by 2016, while 2020, 2018, and 2015 having the same frequency, indicating an average number of studies were published.

RECOMMENDATIONS

According to the study's findings, TOE is the adoption model that can best identify and explain the variables that affect CCA in an organization among TAM, UTAUT, and DOI. Future studies should, however, make use of alternative models, such the Theory of Planned Behavior. Additionally, it was determined that the biggest dangers to CCA in a company were security and privacy. As a result, research is required in other areas of the economy, such as health, education, and so on. In the interim, the scope of this study was constrained to the six-year period of CCA research from 2015 to 2020. Research in the future should be dispersed throughout a ten-year period.

LIMITATIONS

The adoption of cloud computing and the major factors influencing it were the main subjects of this study. Additionally, it concentrated on pertinent studies on cloud computing adoption across many sectors from 2015 to 2020, including SMEs, administration, health, education, and others (unspecified in the original studies).

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