Review Article

Facets related to challenges and prospects of cloud computing adoption in resource-constrained settings: systematic review analysis

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Abstract
Information technology (IT) has evolved into cloud computing (CC), a transformative development that continues to shape global information and communication technology (ICT) strategies. By offering offsite access to computing resources via the Internet, CC provides a pay-per-usage model, flexibility, scalability, and other capabilities, significantly altering business operations worldwide. While the public and private sectors in resource-rich areas are harnessing this potential to enhance performance and service delivery, resource-constrained settings (RCSs)—including economies, regions, countries, and organizations—still face challenges in adopting this technology. This study explores the adoption challenges and opportunities of CC in RCSs. A systematic literature review analysis (SLRA) was conducted following the PRISMA guidelines to identify publications that discuss CC adoption. Seven academic databases were examined, and the reference lists of sixty-one relevant papers were reviewed for inclusion in our final analysis. The significant barriers to CC adoption in RCSs include infrastructure limitations, security and privacy concerns, organizational challenges, and environmental issues. However, the study also identified several opportunities for RCSs, such as enhancing interaction and entrepreneurship, improving education, reducing local ICT costs, and transforming IT practices. Given the unique features of CC technology, particularly online storage, which is seen as a key innovation in the computing revolution, it is crucial for governments and private enterprises in RCSs to leverage, adapt, and utilize CC advancements to boost commercial service performance.

1.Introduction
Cloud computing (CC) refers to the supply of computing resources as a service over the internet. Global economic and social operations may be impacted in multiple ways by CC's pay-per-use technique, adaptability, capacity, and other abilities. CC is currently having an important effect on an array of fields, including information technology (IT), economics, business, schooling, and well-being. The requirements are altered for scholars, both big and small enterprises, and innovators by CC.

There are billions of people who live in resource-constrained settings (economies, regions, countries, and organizations), and these settings have several issues that have been studied for a long time by scholars in fields including sociology, statistics, ecology, and economics [1].

Every aspect of our lives has been impacted by IT, which has had a significant impact on society. The information and communications technology community has been concerned about CC since 2007, which has led to a significant number of industry innovations [2]. A mix of software and hardware through CC is made available instantly and on-demand over the Internet. The customer may often save, generate, update, and retrieve his personal information because of the power of technology. The user can quickly and conveniently use CC applications without having to install them using an Internet-connected device. This technology has the potential to become the major mechanism by which enterprises manage information processing in the future [3, 4]. With this new computer paradigm, a person works in a virtual environment that provides all of the benefits of existing technologies, but at a lesser cost by adopting a "pay-as-you-use" technique [5].

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CC has emerged as a significant contributor to the explosion of information-driven systems across a range of industries, despite the internet's and IT's rapid expansion [6]. Users can access any node, which could be a computer, website, or network, from any location at any time using the notion of CC [7, 8]. This access is meant to make it possible to share flexible computing resources. The central processing unit (CPU), storage devices, memory, and printing services are just a few examples of configurable computer resources. These adaptable computing resources are simple to obtain and require little provider or administrative effort. The use and adoption of CC in resource-constrained settings (RCSs) have the potential to bring about a wide range of advantages, including the facilitation of on-time operation completion, improved efficiency and effectiveness, and the provision of excellent public sector services via sentimental evaluation via CC service models, among others [9, 10].

The technology behind CC has several topographies that define its use and the sectors that require it in situations with limited resources. A crucial component of CC technology is generally acknowledged to be the availability of online storage [11]. This online storage can link to servers and actual storage devices through computer networks, making it easier to dispose of storage resolves [8]. The CC model is a breakthrough computing paradigm that promises to give users access to data and information at any time, from any place, and without being restricted by technology [12]. Since managing computing services is necessary in the CC environment, the internet is unavoidably the only way to set up and enable computer nodes to have access to the services offered by the model.

After grid computing (GC), CC has been seen as a key step toward attaining utility computing, in which computing resources are provided as paid utility services like water and electricity [13]. From a business perspective, it is commonly viewed as an economic model for computing resource rental [14, 15]. Using a "pay-as-you-go" model, businesses can deploy ready-to-use application services while saving money, time, and resources. With regard to the development, planning, and execution of effective business operations, CC has advanced remarkably quickly in a number of domains. Moreover, there are a lot of other applications for CC. A few examples of these applications are job-related apps, social media platforms, scholarly productivity systems, and collaborative game sites [16].

The National Institute of Standards and Technology, (NIST), claims that, the "CC model allows ubiquitous, convenient, upon request network access to a communal pool of programmable computing and services that can be swiftly configured and presented with little to no management or interaction between service providers." CC architectures, security, and deployment techniques make up this definition. Particularly, five fundamental components of CC are clearly defined as follows [17-20]: Whenever-needed self-service allows users to employ real-time remote computer resources (processor time, storage on the network, applications usage, and so forth) to satisfy their needs without involving human interaction. Regardless of the devices that clients use (such as laptops, PDAs, mobile phones, and workstations), all resources must be easily and quickly accessible to users over an internet connection, such as the World Wide Web. Sharing resources with others: Using either the virtualization model or the multi-tenancy model, the supplier's computer resources are pooled together to service numerous clients; different physical and virtual resources are dynamically assigned and reassigned based on client needs. Certain key elements must be established to implement the pool-based computing paradigm, such as economies of scale and specialization. A pool-based approach has the effect of being "invisible" to clients who typically have no idea where these materials are located, how they got there, or what makes them unique actual computing resources like CPU and databases. For example, customers are not able to control where in the cloud their data can be kept. Swift elasticity One of CC's distinguishing features is the facilities' elasticity. This feature enables users to locate fresh resources rapidly to handle a sudden surge or fall in load. Planning the necessary resources for the deployment of any IT service is never simple, especially when the need for such resources is continuously changing.

CC permits the release of IT resources required for the expansion or high use of this service. This implies that even in scenarios where computer resources are pooled and shared by several clients, the cloud's infrastructure can employ the necessary techniques (multi-tenancy). This is the meaning of "determined services," which are those that center around the notion of using each customer's metering capabilities to gauge how these facilities are used [21]. NIST's definition of the Service Model consists of the components platform as a service (PaaS), software as a service (SaaS), and infrastructure as a service (IaaS) (*Figure 1*). Cloud services running on cloud

infrastructure can be accessed by clients through thin client interfaces, such as web browsers, business processes, and apps [22]. For example, Google offers services like Web apps, like Gmail, Google Calendar, and Docs, among others, that work similarly to traditional office suites. Because application providers automatically update any new installations (software and hardware) in the CC model, customers do not need to worry about managing or controlling the infrastructure architecture at a fundamental level. Hardware, operating systems (OSs), and storage are all provided by PaaS as part of an integrated solution, solution stack, or service that can be accessed via the Internet. Customers can create, test, and implement IT services using PaaS, a cloud platform technology.

By abstracting away the complexity of software and infrastructure, this idea streamlines and expedites the creation of online applications. Businesses can use this method to build, test, and launch new applications in addition to leasing virtual IT services to run current ones [23, 24]. The term "IaaS" describes the virtual provision of hardware, connectivity, storage, and server facilities [25]. Clients lease these services on an as-needed basis, with no expectation of managing the underlying cloud infrastructure [25]. Installing and obtaining the necessary resources in their own data center is advised. IaaS can produce benefits by controlling and funding user resource consumption [25, 26].

Although CC has been widely adopted, practitioners and scholars have actively reported problems and difficulties with this new paradigm. Some of the difficulties contain significant components, such as security and confidentiality problems. Assertive the restrictions of this new method inevitably lead to other problems, such as poor performance and constrained bandwidth [27–29]. The resource-constrained environments, contexts, and stakeholders may not have a deeper understanding of these obstacles, which could make remedies ineffective. To help CC adoption in RCSs, we did a comprehensive literature review analysis to identify potential hurdles and opportunities. Using this information, we grouped the studied barriers and opportunities into a nomenclature. The primary goal of this research study is to review the body of information regarding the adoption and use of CC in RCSs that has been published in journals in order to highlight the contributions from recent research and propose possible future research pathways. This gives a precise and thorough grasp of the problems and opportunities that must be handled when it comes to

the adoption of CC by RCSs. It should be highlighted that cloud services can boost flexibility across the board for RCS and the global community at large while lowering IT infrastructure costs in the face of increased demand in contexts where resources are scarce.

The goal of this investigation is to conduct a systematic examination of the body of research on CC acceptance as it relates to RCSs to pinpoint the major topics that have been studied in terms of the obstacles, constraints, and remaining issues that RCSs need to address. The study recommends the high-level framework at the end of the paper which can guide the RCSs during their effort to adopt CC.

Two basic categories of literature are now in use: traditional literature reviews (TLR) and systematic literature reviews (SLR). TLR typically examines the broad trends and transitions in the study issue from a broad perspective. Contrarily, SLR is more focused and tends to "address a narrow set of stated research topics" while using a methodical methodology [30]. CC adoption in RCSs is accompanied by a vast body of scientific research that examines the problem from diverse perspectives.

For RCSs to identify potential obstacles and opportunities for using CC in their contexts, a systematic literature review analysis (SLRA) of these diverse contributions that provide a cohesive nomenclature may be of interest. The phenomena have been the subject of numerous studies and publications, but none has offered a comprehensive picture or sufficient analysis nomenclature of these two truths (challenges and prospects) tailored for any RCSs. Examples include [31] who focused on task scheduling algorithms in CC, [32] who focused on empirical evidence of CC adoption in the higher education system, and [33] who surveyed the literature on CC in education. The current paper study is contrasted with previous work in *Table 1*. To evaluate the level of CC adoption and practice in RCSs (economies, regions, and countries), the current review considers the theoretical facts. Based on the desire to accept CC services and the obstacles to their widespread usage in RCSs, this review can also be helpful for researchers in this developing field in identifying the important aspects of CC adoption in RCSs. Additionally, this assessment provides a current snapshot of the state of CC acceptance in RCSs. This study uses the SLRA to assess the existing literature to fill up these gaps. This approach is useful for identifying the key traits of CC adoption

and use in RCSs and offering a framework for future research to find pertinent problems, difficulties, and research directions. The majority of the already available articles have utilized the Kitchenham and Charters technique [34−36] while concentrating on the broad adoption of CC in particular sectors. Additionally, the research taken into account is primarily empirical with classic literature. To be able to find studies that reported on CC uptake in RCSs and to provide a detailed explanation of the review process, the current paper employed SLRA by the recommended reporting items for systematic reviews and meta-analyses (PRISMA) guidelines. The body of research on the subject reveals a wide range of variables that influence CC adoption in various contexts. The elements that are unique to the location of RCSs are examined in the current review. To achieve this, this study systematically reviews the body of academic literature to identify the elements and chances that will contribute to RCSs' adoption of CC. Thus, the following Research Objective (RO) is raised:

To examine existing literature on the facets related to challenges and prospects of CC adoption by RCSs and identify the underlying adoption factors that need attention by RCSs. Consequently, the following study questions (SQ) are formulated to meet the study goal:
SQ1: Which publications are most frequently cited when attempting to explain the widespread use of CC in various occurrences?
Numerous pertinent papers have been searched to comprehend publications related to CC adoption (See section III, *Table 7*). The next research question is guided by this one.
SQ2: What factors regarding the deployment of CC should RCSs be aware of?
Any RCS's adoption choice is unavoidably a delicate and complicated one that is based on a variety of variables.

The paper is organized as follows: Section 2 reviews related literature on CC; Section 3 describes the study methods; Section 4 presents the results; Section 5 provides a discussion; Section 6 offers the conclusion; and Section 7 explores future work.

2.Literature review
2.1CC and RCSs
As was mentioned in the beginning, there are billions of people who live in environments with limited resources. These contexts and their various administrative structures deal with several topics that scholars have long examined [37]. Some of these fields include sociology, statistics, ecology, economics, and IT. The latter has had a considerable impact on these communities' citizens' daily lives in all areas as well as on societies with little resources [38]. CC is one of the most common IT trends in environments with limited resources. Civilizations below the development barrier in particular stand to gain significantly from its potential [39]. The operation of this paradigm promotes users to regularly produce, store, access, and update their personal information using technological means [39] [40]. It achieves this by providing a selection of software and hardware in real-time on demand over the internet. If they can perform the aforementioned actions, users of CC services can simply access CC apps using a device connected to the internet without the need to install them [41]. Firms in the RCSs may use CC technology as their major conduit for managing business operations in the future, according to claims provided by [42−44]. When using CC, a user performs their work virtually, enabling all the advantages to be given and enjoyed at lower costs by implementing the "pay-as-you-use" idea formula [45−47].

2.2The context of resource-constrained settings (RCSs)
RCSs are defined as any geographic location that is consistently located near the bottom of much taxonomy [48]. In areas with few resources, it is frequently substantially more difficult to access data, processing power, and the Internet [49]. The cash-strapped governments of RCSs may increase access to finance, healthcare, education, and trade through the deployment of CC technologies. Although the cloud market is small, it is expanding quickly in places with few resources. Given that the process of economic expansion radically alters the structural characteristics of developing economies, the information and communication technology (ICT) sector offers a tempting avenue for exports and service-sector development. CC also frequently results in decreased hiring expenses for IT staff. In regions with few resources, few organizations are using CC [50]. In areas with little resources, such as Nigeria, Ethiopia, and other nations, CC seems to be in its infancy. The attractive properties of CC provide significant advantages to enterprises, governments, and end users in a world with limited resources. Numerous difficulties must be addressed to simplify matters and increase the usage of CC services in these areas. One of the most serious problems with RCSs is a lack of connectivity and adequate

bandwidth, particularly in areas where dial-up networks are still commonly utilized [51].

Studies that examined the adoption of CC in environments with limited resources are very uncommon in the literature. Examining the elements that affect CC adoption in resource-constrained contexts, such as implementation difficulties and CC features, may out to be quite advantageous. It can help decision-makers in these places implement CC profitably. This report also considers how CC is used in e-government, education, and small and medium-sized organizations. The technological organization environment (TOE) framework, which has been frequently used for investigations in an organizational setting, is heavily emphasized in this study. Several empirical and conceptual studies [52] have supported the TOE framework's applicability, dominance, and significance in defining technology

adoption and identifying the skills required to move to the cloud.

2.3 Cloud computing service models (CCSMs) and cloud computing deployment models (CCDMs)

Two (2) important realities regarding the CC paradigm that are well-known in both the RCSs and the general world must be understood by any institution planning to investigate the potential of CC. The CC Service Models (CCSMs) and CC Deployment Models (CCDMs) are supposed to represent these realities, according to [53, 54]. The former describes the kind of service(s) that is (are) to be requested and delivered, whilst the latter determines the location of the requested service(s), which in turn defines the type of access to the service. *Figure 1* and *Table 1* provide respectively, the additional details on the aforementioned facts.

Table 1 Summary of four (4) CCDMs

| CCDM	Description
Public Cloud	This is open to the public. It offers a comparable variety of skills and services, is accessible online, and is made to be utilized by everyone.
Private Cloud	This is handled by a specific business. Either on-site or off-site activity is possible.
Community Cloud	This is reserved for a group of people and is meant to be used by several organizations with related purposes.
Hybrid Cloud	This is made up of two or more different cloud classes.
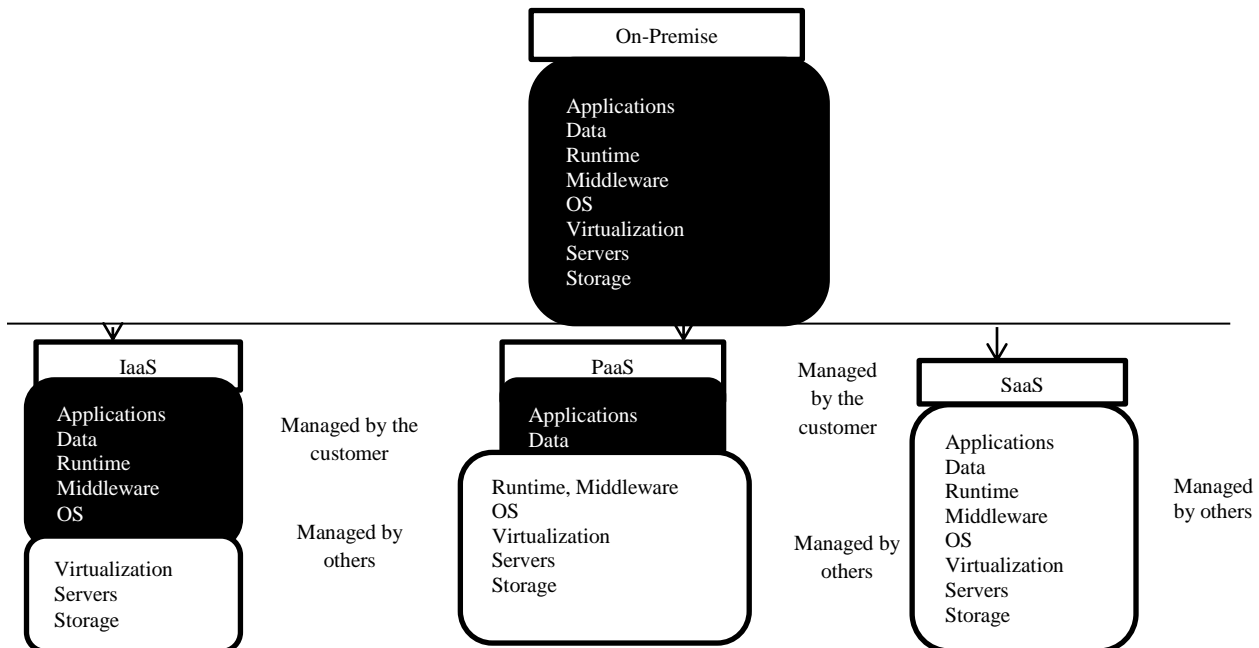
Figure 1 Summary of the main differences among the three (3) CCSMs

3.Methodology

There are several methods for conducting literary reviews, including conventional, traditional, or narrative methods. The main goal of a conventional (traditional or narrative) literature review is to evaluate and synthesize a body of literature. To be able to do this, the relevant literature is carefully evaluated to identify knowledge gaps, draw attention to discrepancies, and suggest new research directions [53, 54]. Methodical in comparison, SLR takes a more rigorous approach to literature analysis, presumably because they are usually employed to meet incredibly precise and well-structured study objectives [53, 54]. This initial evaluation of the breadth and depth of the research literature is provided. This method makes an effort to categorize the kind and volume of research evidence, which is frequently continuing study. The review of scoping can also be done using, among other things, the PRISMA extension statement [53, 54]. However, we used the SLRA standards utilizing PRISMA guidelines in this study to explain the review methodology and identify papers that state CC uptake in resource-constrained situations [55].

Studies from systematic reviews can be justified as being pertinent since, in contrast to controlled trials or case studies, they offer concise research implications to practice on a particular subject that is regarded as rigorous and reliable. Systematic reviews [56] encourage a method of identifying, evaluating, analyzing, and integrating all the research relevant to a certain study topic area, or phenomenon of interest. One of the primary objectives of the systematic review is to improve the validity and reliability of the research findings by presenting information in a transparent and rigorous manner [57]. The protocol for the systematic review procedure instructs the study on what is previously known, how the evidence was generated, and how it may differ between studies based on the research environment and demographics [57]. This is true even though original research oversight is crucial for the generation of fresh information, ideas, and evidence. To assist researchers in performing SLR, a technique that is particularly suitable for such studies should provide instructions. The PRISMA standards and processes are followed in the systematic review that is given in this research study [57].

These factors mean that developing a search strategy that includes keywords, sources of support, inclusion and exclusion criteria, search documentation, and the selection of pertinent research reports should be part of systematic review research. As shown in *Figure 2*, a total of 1138 studies were found during the initial search. After carefully reviewing all abstracts, applying the inclusion and exclusion criteria, and removing duplicates at the screening and eligibility stages, we chose 61 papers for data extraction and quality assessment. Given that the bulk of papers cover CC, especially in RCSs, this statistic is appropriate. There aren't many publications on this topic, as well. The workflow of a few selected research articles is shown in *Figure 2*. Our research study plan is divided into four (4) stages: Identification of the article, screening of the item, assessment of the article's suitability, and inclusion. *Table 2* shows the 4 steps that guided the study under the adopted methodology.

Table 2 Summary of steps for PRISMA Flow chart as applied for paper selection

| Step	Description
1. **Article identification**	This step of the process discusses the strategies and tactics employed to locate pertinent databases and knowledge repositories, as well as the search terms and strategies that were employed. This was the first stage of the SLRA in the instance of this study, which entailed extensive searches of the article abstracts as well as the citation of specific scholarly databases.
2. **Article screening**	Reading the title, abstract, or summary, and keywords for each article was part of this step. This stage was designed to see if the content of each chosen article was appropriate for the topic under study.
3. **Determining the eligibility of the article**	To facilitate the compilation and comparison of findings to verify the eligibility and caliber of the included articles, the material of the reviewed papers was methodically coded.
4. **Included**	The important findings (numerical and descriptive) of the issues that commonly appeared in the papers under study were included in this stage's final section. Based on similar conclusions offered by authors whose research is appraised, the scope of the difficulties and opportunities associated with CC in RCSs were calculated.
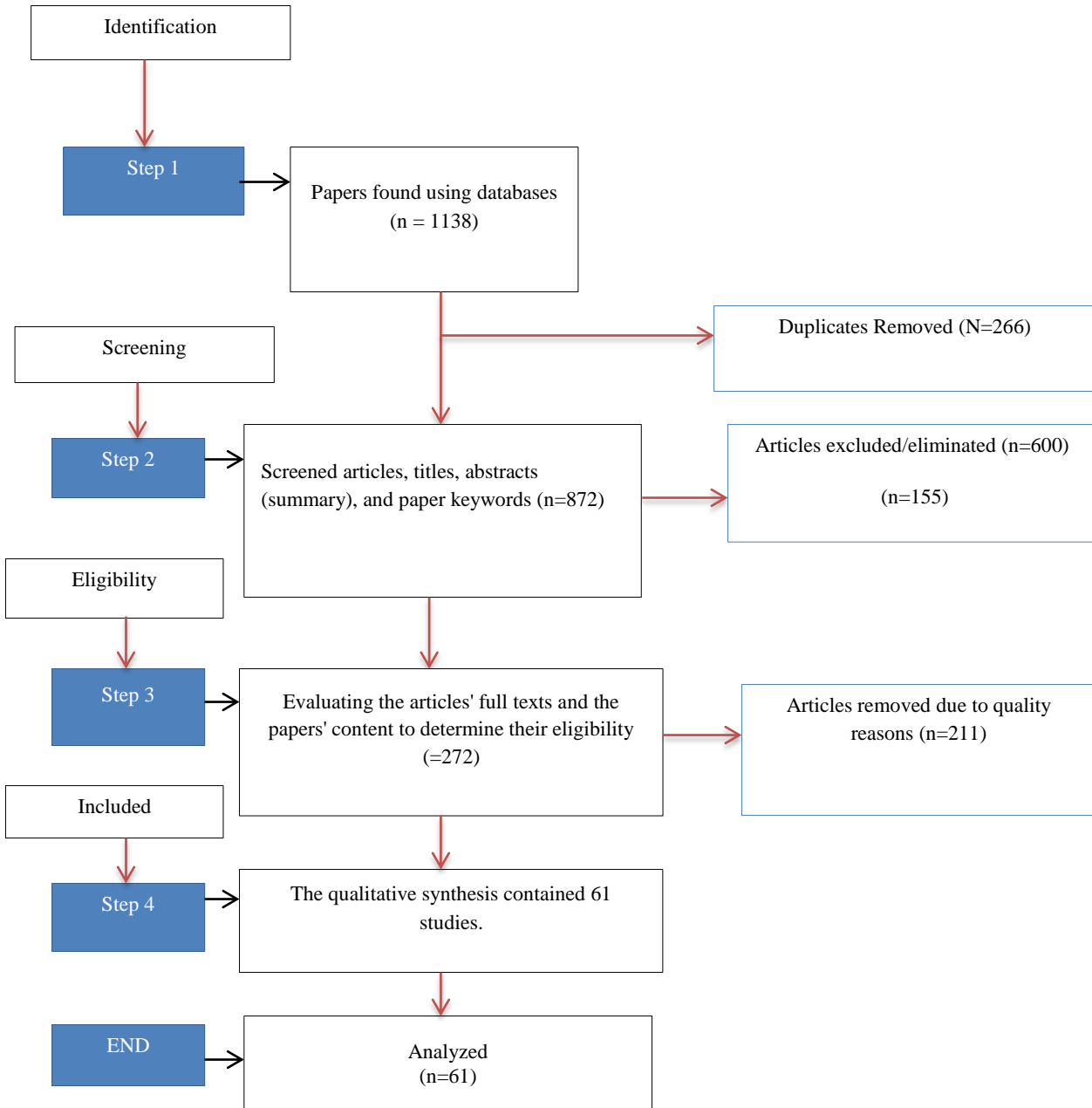
Figure 2 PRISMA strategy

3.1 Some common attributes of the selected studies

A-The Search Key words: The search terms in *Table 3* define our typical search keywords applied for our systematic literature evaluation.

B-Criteria for inclusion and exclusion: The inclusion and exclusion criteria used during the SLRA are highlighted in *Table 4*. We examined several studies depending on our adopted inclusion and exclusion criteria.

C-Electronic data sources and general results: *Table 5* shows the selected academic databases for literature searches and the related results (frequency and percentage) from each scholarly database.

D-Annual count of the papers: *Table 6* shows the delineation of the annual count of papers, differentiated based on their classification as journal, book, or conference papers spanning the literature from 2016 to 2023. *Table 6* summarizes the annual count of the selected papers differentiated based on classification as journal, book, or conference papers.

Table 3 Search phrases

S/N	Phrase
1	("Challenges of CC Adoption in Resource-constrained **countries**")
	OR
	("Challenges of CC Adoption in Resource-constrained **economies**")
	OR
	("Challenges of CC Adoption in Resource-constrained **regions**")
	OR
	("Challenges of CC Adoption in Resource-constrained **organizations**")
2	Prospects of CC Adoption by Resource-constrained **countries**")
	OR
	(Prospects of CC Adoption by Resource-constrained **economies**")
	OR
	(Prospects of CC Adoption by Resource-constrained **regions**")
	OR
	(Prospects of CC Adoption by Resource-constrained **organizations**")
3	("CC adoption")

Table 4 Inclusion/Exclusion criteria

Inclusion	Exclusion
Research paper/article	Any other language papers
Published between 2016 and 2023 and pertinent to our research queries.	Papers that did not have any link to the research questions
Peer reviewed	Gray papers like papers excluding CC with no relevance to research questions or incomplete papers
Empirical studies	
English papers	Studies whose texts were unavailable through search engines or from the authors themselves cannot have their validity confirmed.
Case studies	
All papers discussing CC adoption in under-developed and middle-developed countries	Short papers (<6 pages)
Papers (>=6 pages)	None peer-reviewed studies and Preprints
Conference papers	Any outdated papers or papers with the same author because this information tended to be duplicate

Table 5 Electronic database sources and corresponding search results

Database	Frequency	Percentage
Science Direct	110	10.00%
Wiley Online Library	169	15.00%
Scopus	170	15.00%
IEEE Explore	180	16.00%
ACM Digital Library	230	20.00%
Taylor & Francis	105	9.00%
Springer	174	15.00%
Total	**1138**	100.00%

Table 6 The delineation of the annual count of papers

Journal or conference papers or Book (Reference Type)	Annual count of papers	Percentage (%)	Year (Y)
ACM Digital Library (Journal)	9	12.00%	2022
IEEE Explore (Books)	4	6.00%	2023
IEEE Explore (Conference)	1	2.00%	2017
IEEE Explore (Conference)	2	4.00%	2021
IEEE Explore (Journal)	17	25.00%	2023
Science Direct (Journal)	3	6.00%	2018
Scopus (Journal)	5	10.00%	2020
Springer (Journal)	10	21.00%	2021

Journal or conference papers or Book (Reference Type)	Annual count of papers	Percentage (%)	Year (Y)
Taylor & Francis (Journal)	8	10.00%	2019
Wiley Online Library (Journal)	2	4.00%	2016

E-An overview of the selected paper distribution across various publishers:
The distribution of the chosen papers and studies by database source is shown in *Figure 3*. There were sixteen papers in the IEEE database, eleven in the ACM Digital Library, ten in Springer, nine in Scopus, six in Taylor & Francis, five in Science Direct, and four in Wiley Online Library.
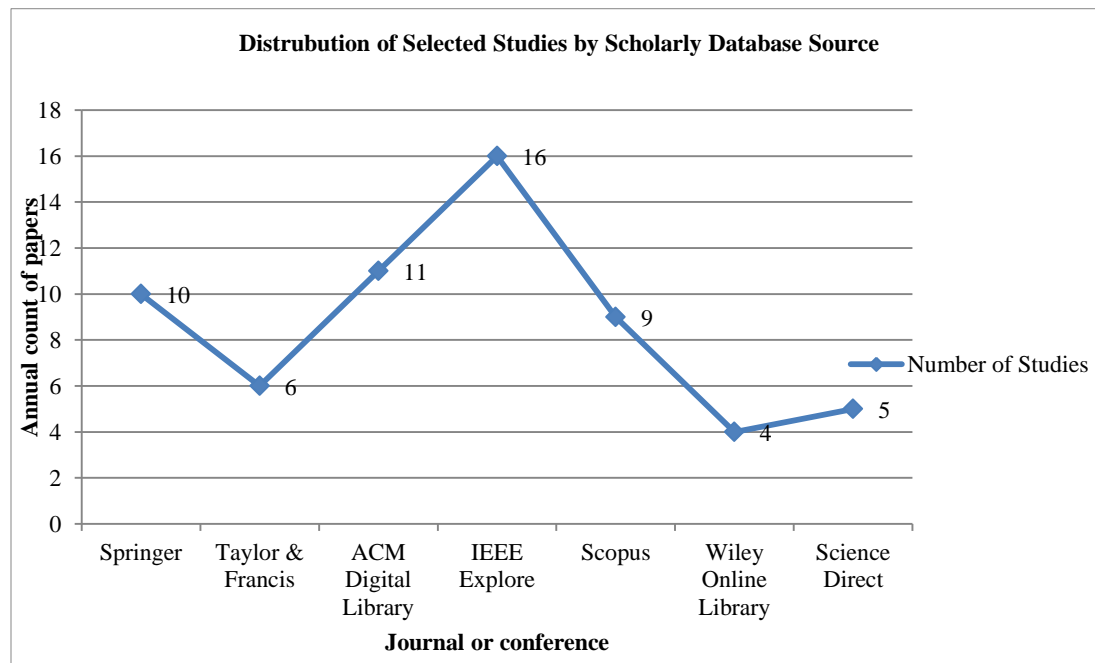

Figure 3 Distribution of articles by database source

F-The summary of some of the selected publications: Some of the studies considered for the content analysis of the study are summaries in *Table 7*. The articles concentrated on different aspects of CC adoption in diverse contexts. The summary provides the essential details about the article, that is to say: the method/approach used, findings of the study, advantages and limitations of the method/approach used.

4.Results
The results of the 61 papers that were evaluated are shown in three dimensions: the distribution of publications across time, as shown in *Figure 3,* the research method/approach employed, as shown in *Table 7*, and finally, the advantages and factors that RCSs should consider when adopting CC. *Figure 1* show that from 2016 to 2023, interest in studying the adoption of CC increased dramatically, indicating that CC adoption is noteworthy.

Distribution of the selected papers categorized by year: The study considered studies published between 2016 and 2023 for analysis (*Figure 4*). These studies were distributed as 2023 (21), 2022 (9), 2021 (12), 2020 (5), 2019 (8), 2018 (3), 2017 (1), and 2016 (2). The fact that the majority of the publications were published in 2023 shows how popular and interesting this area of study is.
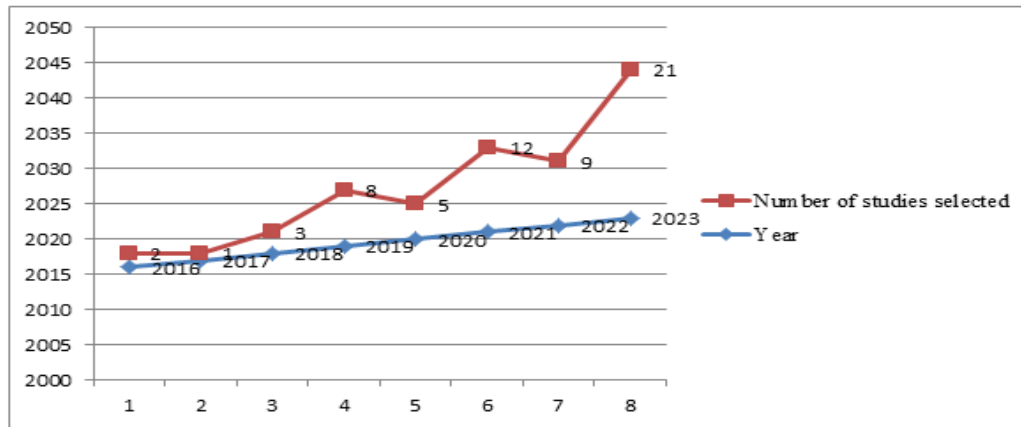
Figure 4 Distribution of the selected papers over the years

This section presents the review article's conclusion. According to the reviewed research, CC may be able to provide RCSs with a variety of new chances to do things that they were previously unable to do using computers and the Internet. RCSs can benefit from and have fascinating consequences from CC. Users who have mobile devices, Tablet personal computer (PC), one-laptop-per-child (OLPC) [one-laptop-per-child], and other mobile devices can connect with CC infrastructure and apps [58, 59]. The CC revolution in RCSs has the potential to alter how people interact and conduct business. As cellular data networks become more advanced and dependable, the same people can access the internet on their mobile devices without needing a computer or broadband at home. Many different CC uses may become possible as a result.

The IT revolution in RCSs can be greatly facilitated by the use of CC, which aids businesses in reaching the billion consumers at the base of the pyramid with their goods and services [60, 61]. In the modern world, hundreds of millions of people already have access to small, portable devices in their daily lives. Additionally, a lot of evidence suggests that RCSs can use the mobile cloud before they use the "regular" one [62]. Higher education and research institutions have more control given the utilization of cloud services, giving them the chance to reconsider which services are necessary to support learning and research as well as the most effective means of delivering those services [63, 64]. The public cloud has several services that are readily available. Certain services must be purchased through the institution's IT division. Only a few services will need to be developed specifically, either alone or in collaboration with other organizations. The finished product can probably be a loosely connected,

customized setup made up of commercially available systems and services based on tested technology [64–66]. Additionally, because they lack local technical assistance, universities and public libraries in RCSs are finding it difficult to shift to open-source integrated library systems. CC can assist with this transition [66–68]. Utilizing CC could lessen incentives for RCSs local ICT capability [69–71]

Reducing computation expenses for researchers is another advantage that cloud services in RCSs can provide [71–73]. Few academics actually require high-performance computing (HPC) equipment with several cores. Most academics can benefit greatly from capacity computing, or systems that share their processing resources with multiple and even many users. CC shines in this capacity computing area. Microsoft and the National Science Foundation recently announced an arrangement that can grant free access to the Windows Azure CC capabilities to a select number of researchers and research groups. This project expands the range of opportunities available to institutions and scholars alike.

Despite the clear advantages and benefits of CC for RCSs, the research uncovered several difficulties that RCSs must address if they are to effectively take use of the opportunities provided by CC technology. The integration of TOE paradigm [74, 75] is used in this study to pinpoint and categorize the realities of problems associated with CC implementation in RCSs. The hypothesis explains how the organizational environment affects how new technology is integrated at the organizational level. The three facets of the model that determine how innovations are accepted are the technological context, organizational context, and environmental context. Additionally, this strategy has recently been

investigated in some studies to look at the adoption of CC [76]. The technological context explains the potential effects of implementing new technology on the business as well as the effects of both internal and external technologies [77, 78]. The organizational aspect interprets several corporate rules, including scope, enterprise size, and complexity of the management system. The environmental component includes the sector's structure, the regulatory environment, and the existence or lack of technological service providers. As shown in *Table 8*, the CC adoption model highlights three (3) key elements: organizational, environmental, and technology variables.

The Elements of Technology: a) The phrase "the extent to which a technological factor is perceived as providing greater benefit for firms" describes relative advantage in technology. Compared to traditional technologies, CC offers benefits including shared resources, mobility, scalability, flexibility, and reduced costs. The degree to which an innovation is seen as compatible with the existing values, past experiences, and requirements of potential adopters is known as compatibility (b). Complexity (c) is defined by the perceived level of difficulty in comprehending and using a system and d) Security: A major obstacle keeping many RCS firms from utilizing CC is a lack of security. The main obstacles to the CC paradigm's adoption are data security and privacy [79–86]. The Aspects of Organization:

a) Top Management Support: Senior management support is essential for deploying different information technologies. Technology might advance by creating an environment within the firm that welcomes change, senior officials' attitudes and actions towards the application of technological innovation to create values for the organization, b) Cloud Knowledge: This refers to the degree of familiarity with the IT infrastructure and human resources concerning CC [87–98].

The Environmental Factors: a) Regulatory Environment: This generally refers to any place that is subject to regulation. Rules outline the conditions that an organization must meet to deliver valid results, of a level of quality that is assured, and without a data breach [99–106], b) Competitive pressure: This refers to the amount of pressure that rival businesses apply to a business. Industry competition is frequently seen to have a positive impact on IT adoption. c) Trading Partner Support: This has established a connection with cloud service providers in the context of CC. It is recommended that service providers make their data accessible at all times, or more specifically when customers need it. Service-level agreements and a combination of preventative actions are preferred to ensure adequate levels of availability and accessibility. d) Physical location: For various reasons, including data security in the cloud and the fact that certain cloud vendors store their customers' data in other countries without their knowledge, physical location influences a company's decision to use CC [106–108].

Table 7 Key previous studies examining the adoption of CC in various environments

S. No.	Author	Approach	Findings	Advantages of the method used	Limitations
1.	[58]	A Short Review	A brief overview and study of cloud adoption, as well as related difficulties and challenges	Summarize the publications in paragraphs (2-4) The ordering isn't random	Needs a single-paragraph summary of the article. Extrapolate and articulate the key findings shortly and succinctly. Once a few summaries of an article are written, the decision of order of presenting them must be decided.
2.	[59]	An empirical study's systematic literature review (SLR)	The present levels of CC adoption in Higher Education Institutions (HEIs) were investigated, as well as the benefits and limitations of implementing CC in HEIs.	Aims to incorporate all available information about a subject	Limited to concentrating on a certain study methodology.
3.	[60]	A systematic literature review	Potential CC issues in general	Seeks to include all knowledge on a topic Comprehensive and Exhaustive	Restrictive to focusing on a certain method used in studies.
4.	[61]	A systematic literature review	Adoption of CC among SMEs, with a focus on the post-adoption period.	Allow the review to be conducted more thoroughly and rigorously.	Restrictive to focus on a single research method. vulnerable to specific forms of biases

S. No.	Author	Approach	Findings	Advantages of the method used	Limitations
				Attempts to include all knowledge on a topic that is reproducible	
5.	[33]	Literature Review	CC in Education in Developing Countries	Bringing together what has been accomplished without repetition and identifying gaps or omissions all within a summation.	There is not set method to make sure all the literature on a topic was considered. The chances of the review being biased increases
6.	[62]	Literature review	Adoption of CC for E-Commerce in Developing Countries: Contributing Factors and Implications for Indonesia	Bringing together what has been accomplished without repetition and identifying gaps or omissions all within a summation.	There is not set method to make sure all the literature on a topic was considered. The chances of the review being biased increases
7.	[63]	Data from prior studies were retrieved and supplemented using a questionnaire survey. The acquired data was investigated using the Relative Importance Index (RII) approach. Exploratory Factor Analysis (EFA) is used.	Significant advantages of data storage universality (i.e. location independence), high situational awareness, team communication, interoperability with innovative manufacturing facilities, and better project planning.	Has the ability to provide a more comprehensive picture than a single-method review.	It is up to the searcher to demonstrate the value-added that the various methodologies and conclusions provided by the research provide. It is also challenging to evaluate the many qualitative and quantitative data.
8.	[64]	An analysis	Identifies the possible problems and opportunities connected with CC use for sustainable development.	Putting what has been completed together without repetition and recognizing gaps or omissions all inside a summary.	There is no defined technique for ensuring that all literature on a topic has been considered. The likelihood of the review being biased rises.
9.	[65]	UTAUT's strategy is centered on the student perspective. Empirical Study	Factors influencing CC service uptake in higher education institutions	Incorporates minor or inconclusive studies into larger studies to help them reach conclusions that they would otherwise be unable to reach.	It is only as excellent as the studies utilized to produce it. Some contend that combining the findings is like comparing apples and oranges.
10.	[66]	A Structured Literature Review	A CC adoption strategy for research institutions in Kenya	Bringing together what has been accomplished without repetition and identifying gaps or omissions all within a summation.	There is not set method to make sure all the literature on a topic was considered. The chances of the review being biased increases
11.	[67]	An Empirical Study	Establishing Guidelines for Evaluation and Adoption of Secure and Cost-Effective CC	Similar incidents can be prevented or replicated. The research's adaptability enables the scientists to modify some of its components and adapt them to new objectives.	Time consuming. Empirical studies are time-consuming because they require researchers to collect data through multiple sources. An empirical approach is Expensive. Difficult to acquire consent/permission. Data collection in the empirical approach can be a problem.
12.	[68]	A thorough examination of the literature was followed by a	CC Adoption in Singapore's Construction Industry: Drivers, Challenges, and Strategies	Has the potential to give a whole picture view that single method review can give	Dependent upon the searcher to demonstrate value-added that the variety of methods and findings the studies give. There is also difficulty

S. No.	Author	Approach	Findings	Advantages of the method used	Limitations
		systematic questionnaire survey.		It is a strong addition to the quantitative elements of a study.	in evaluating the different qualitative and quantitative results. There are differing opinions about when specific methods are necessary for the review.
13.	[69]	Review	SMEs, Barriers, and Opportunities to Adopting Industry 4.0:	Has the ability to provide a more comprehensive picture than a single-method review.	It is up to the searcher to demonstrate the value-added that the various methodologies and conclusions provided by the research provide. It is also challenging to evaluate the many qualitative and quantitative data.
14.	[70]	Quantitative Approach	Factors of knowledge and innovation: how CC improves students' academic performance	Quick, focused, scientific, and approachable Concerned with facts and verified data.	Only numbers and figures are allowed. Tests can be designed to be purposely deceptive. The outcomes are susceptible to personal interpretation.
15.	[71]	A Review	Issues, Challenges, and Opportunities in IoT and CC	Has the ability to provide a more comprehensive picture than a single-method review.	It is up to the searcher to demonstrate the value-added that the various methodologies and conclusions provided by the research provide. It is also challenging to evaluate the many qualitative and quantitative data.
16.	[72]	Simulation	When UAV Swarms Meet Edge-CC: A Quality-of-Service Perspective	Simulation enables you to investigate 'what if' questions and scenarios without having to test the system itself. It aids in the identification of bottlenecks in material, information, and product flows. It assists you in determining which variables are most critical to system performance.	The quality of the analysis depends on the quality of the model and the skills of the modeler, who requires specialized training. It is a time-consuming and expensive process, so should not be used if an analytical method can provide quicker results.
17.	[73]	Experimental approach	Crane Cloud: A resilient multi-cloud service abstraction layer for RCS	Researchers can control more variables to get the desired outcomes. The efficacy of experimental research is independent of the topic or sector. The outcomes are particular. Following analysis of the data, you might apply your conclusions to related concepts or circumstances.	Results are highly subjective due to the possibility of human error. It is a time-consuming process. There may be ethical or practical problems with variable control.
18.`	[74]	A big Picture	CC Features, Issues and Challenges	It specifies "what is the overall information (concept, claim, argument, idea, or key issue) that needs to be conveyed and how it should be broken down."	Present each portion in a logical order (smaller to larger or larger to smaller) by explaining how each item is related to each other and how each fits into the "Big Picture" part using a graphic organizer (e.g., concept map, classification table, and flow chart).
19.	[75]	Empirical research	A CC Adoption Framework for Developing Countries	It is possible to replicate or prevent similar events. The flexibility of the research Allows the	It takes time. Empirical investigations take time because researchers must collect data from a variety of sources.

S. No.	Author	Approach	Findings	Advantages of the method used	Limitations
				researchers to change certain aspects of the research and adjust them to new goals	An empirical approach is costly. It is difficult to obtain consent/permission. Data collecting can be difficult in the empirical approach.
20.	[76]	A Systematic Literature review	Big Data on the Cloud: Opportunities for Small and Medium-sized Businesses	Seeks to methodically find, evaluate, and synthesize research evidence, frequently conforming to review procedures. Attempts to incorporate all information on an issue	Limits research to a single approach.
21.	[77]	A Case Study	CC Problems, Opportunities, and Possibilities	It may be difficult to repeat the results. Used to create new hypotheses, expand on existing theories, and challenge conventional beliefs.	Case studies can be costly and time-consuming to conduct. The phenomenon known as researcher bias occurs when researchers allow their emotions to influence the case study. Case studies may lack scientific rigor and methodologies to ensure the accuracy of data acquired.
22.	[78]	TAM	CC is adopted as a strategic technology for sustainable development using regression analysis.	TAM is simple to understand and has a high level of predictiveness in various scenarios due to its few elements. Takes into account both external and social influences.	TAM, which was originally designed for IT adoption in the office, ignores the numerous needs applicable to the voluntary consumer setting. The absence of subjective norms or social impact is a key criticism of the original TAM.
23.	[79]	Empirical Research	CC to Fog Computing: A Paradigm Shift	It is possible to replicate or prevent similar events. The flexibility of the research Allows the researchers to change certain aspects of the research and adjust them to new goals	It takes time. Empirical investigations take time because researchers must collect data from a variety of sources. An empirical approach is costly. It is difficult to obtain consent/permission. Data collecting can be difficult in the empirical approach.
24.	[80]	Case study	Ethiopia as a case study for the implementation of CC in higher education using an integrated TOE– diffusion of innovation (DOI) framework	Results can be difficult to replicate Used to develop new theories, expand on existing theories, challenge traditional theories	Case studies can be costly and time-consuming to conduct. The phenomenon known as researcher bias occurs when researchers allow their emotions to influence the case study. Case studies may lack scientific rigor and methodologies to ensure the accuracy of data acquired.
25.	[81]	Analyzing IT professionals' experiences in conjunction with cloud adoption literature	CC Adoption in South Africa: Critical Success Factors	Materials that provide an examination of recent or current literature are published. Can cover a wide range of topics with varying degrees of depth and comprehensiveness Contains a summary of what has been completed without repeating and identifies gaps or omissions.	There is no defined technique for ensuring that all literature on a topic has been considered. The likelihood of the review being biased rises.
26	[82]	Survey Research	Accounting for institutional variables in CC adoption in Ghana	Survey research designs are still widely used in many fields. Surveys might appear to be	Valid results, however, are dependent on the researcher having a clear knowledge of the circumstances in which they are

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S. No.	Author	Approach	Findings	Advantages of the method used	Limitations
				deceptively basic and easy to implement.	acceptable, as well as the limits on inference in interpreting and generalizing from survey findings.
27.	[83]	Institutional theory	Adoption of CC: A Cross-Continent Overview of Challenges	It helps academics to extend the reach of their studies. A systematic analysis of innovation is made possible by theoretical contributions concerning the differences between formal and informal institutions, regulative, normative, and cultural-cognitive types of institutions, as well as the many levels of institutions.	External sociological and psychological aspects received little or no attention. Its assumptions of organizational passivity, failure to address strategic conduct, and exercise of influence in its institutionalization ideas.
28	[88]	Empirical study	Factors influencing CC uptake in Indian school systems	Similar incidents can be replicated or avoided. The research's adaptability Allows researchers to modify certain components of their research to meet new objectives.	It takes time. Empirical investigations take time because researchers must collect data from a variety of sources. An empirical approach is costly. It is difficult to obtain consent/permission.
29	[89]	An empirical examination of the services sector	A methodology for assessing the critical elements influencing CC adoption.	Similar incidents can be replicated or avoided. The research's adaptability Allows researchers to modify certain components of their research to meet new objectives.	It takes time. Empirical investigations take time because researchers must collect data from a variety of sources. An empirical approach is costly. It is difficult to obtain consent/permission.
30	[90]	Empirical study	Opportunities and Challenges of CC in Developing Countries	Similar incidents can be replicated or avoided. The research's adaptability Allows researchers to modify certain components of their research to meet new objectives.	It takes time. Empirical investigations take time because researchers must collect data from a variety of sources. An empirical approach is costly. It is difficult to obtain consent/permission.
31	[91]	A review	Exploring the empirical studies of CC adoption in Anglophone West African countries' academic libraries	Has the ability to provide a more comprehensive picture than a single-method review.	It is up to the searcher to demonstrate the value-added that the various methodologies and conclusions provided by the research provide. It is also challenging to evaluate the many qualitative and quantitative data.
32	[92]	A review	A. Role of CC in management and education	Has the ability to provide a more comprehensive picture than a single-method review.	It is up to the searcher to demonstrate the value-added that the various methodologies and conclusions provided by the research provide. It is also challenging to evaluate the many qualitative and quantitative data.
33	[93]	Empirical study	Enhancing Algebraic Multigrid Scalability with CC	Similar incidents can be replicated or avoided. The research's adaptability Allows researchers to modify certain components of their research to meet new objectives.	It takes time. Empirical investigations take time because researchers must collect data from a variety of sources. An empirical approach is costly. It is difficult to obtain consent/permission.
34	[94]	Technology-	Developing a hybrid	Larger sample	Inflexibility and issues with

S. No.	Author	Approach	Findings	Advantages of the method used	Limitations
		Organizational-Environmental and DOI Theories A quantitative technique using survey design	methodology to impact academic libraries in Northeastern Nigeria's plan to use CC	Objectivity and accuracy Cost-effectiveness, Generalizability, Reliability, and Versatility	validity
35	[95]	Questionnaire survey	Saudi Arabian government institutions' use of CC based on Vision 2030	Flexibility Easy analysis	Provide Sampled Data, not Complete Data
36	[96]	A big Picture	The Business Value of CC	It specifies "what is the overall information (concept, claim, argument, idea, or key issue) that needs to be conveyed and how it should be broken down."	Present each portion in a logical order (smaller to larger or larger to smaller) by explaining how each item is related to each other and how each fits into the "Big Picture" part using a graphic organizer for example concept map, classification table, and flow chart).
37	[97]	Empirical study	Possibly Dangerous: Using Cloud Services Outside of the Nation	Similar incidents can be replicated or avoided. The research's adaptability Allows researchers to modify certain components of their research to meet new objectives.	It takes time. Empirical investigations take time because researchers must collect data from a variety of sources. An empirical approach is costly. It is difficult to obtain consent/permission.
38	[98]	Semi-structured interview study	The main obstacles to and possibilities presented by CC in healthcare	Acquire in-depth information and evidence Reliable data, and the flexibility to ask follow-up questions	It may leave room for bias
39	[99]	Systematic methodology	An examination of different uses and associated difficulties in CC	Control and Sense of Process Easy to Execute and Understand	Risk of bias Risk of data manipulation
40	[100]	An empirical analysis using TOE and contextual theory	Factors affecting Lebanon's SMEs' adoption of CC services	More reliable because it represents a real-life experience and not just a theories Data collected through empirical research may be less biased because the researcher is there during the collection process.	It can be time-consuming depending on the research subject. It is not a cost-effective way of data collection in most cases because of the possible expensive methods of data gathering. Moreover, It is not easy to get information on sensitive topics, and also, researchers may need participants' consent to use the data.
41	[101]	A survey	An overview of the problems, risks, and solutions related to security in CC	Survey research designs are still widely used in many fields. Surveys might appear to be deceptively basic and easy to implement	Valid results, however, are dependent on the researcher having a clear knowledge of the circumstances in which they are acceptable, as well as the limits on inference in interpreting and generalizing from survey findings.

Table 8 Indication of challenges of CC adoption in RCSs

Construct	Challenge Category
Complexity	Technology
Compatibility	Technology
Relative advantage	Technology
Security	Technology
Privacy	Technology
Vendor-Lock-in	Technology
Cloud Knowledge and skills	Organizational
Top management support	Organizational

Construct	Challenge Category
Physical location	Environmental
Trading partner support	Environmental
Competitive pressure	Environmental
Regulatory environment	Environmental

5.Discussion

It might be argued that investing in technology infrastructure, such as internet connectivity, is one recommendation based on the reviewed literature for reaping the advantages and overcoming the barriers to CC adoption in RCSs. To increase the stability and speed of their internet connections, RCSs ought to make investments in the growth and development of their infrastructure. This can make it simpler to guarantee that businesses operating in these environments can access cloud-based services and can quickly and securely move data to and from the cloud. In the same way, most of the technological obstacles listed in *Table 7* can be solved. Additionally, by encouraging the emergence of new enterprises and industries, infrastructure investment can boost the creation of jobs and economic growth by enhancing the provision of public services like social welfare, healthcare, and education.

For example, compatibility is the degree to which an invention is thought to be consistent with the organization's needs and beliefs; compatibility is influenced by past experiences. If CC is recognized as a technology that is consistent with both current work application systems and organizational values and beliefs, then organizations are more inclined to take it into consideration. Compatibility is considered to be a crucial criterion for acceptance of new IS innovations. With the help of CC, businesses may stay on the cutting edge of technology without having to make changes to their existing legacy IT systems that support their administrative and operational requirements. Relative advantage is another aspect that is crucial to the adoption of fresh IS advances. The perception that a technical aspect benefits firms more is known as relative advantage.

The development of technical knowledge, skills, and abilities with an awareness component is another suggestion. Bottlenecks in organizational groups can be resolved as a result of this. As a way to guarantee that individuals have the skills, knowledge, and understanding necessary to establish and manage cloud-based systems as well as to create new cloud-based businesses and industries, RCSs should make investments in the training and education of IT specialists, software developers, and personnel of

organizations in both the public and private sectors. Furthermore, this might help guarantee that companies operating in these settings have the hard and soft skills needed to properly utilize the opportunities provided by CC and to successfully resolve the issues. Because the introduction of CC may require integrating resources, and activities, and reengineering some processes, senior managers play a crucial role.

The adoption of CC is therefore thought to be significantly impacted by this difficulty. Additionally, this can support economic growth and open up new employment prospects for people with technical expertise in RCSs. Briefly said technological context describes the internal and external technology that the company can use. This covers both commercially accessible and presently employed by the organization technology.

For firms aiming to foster a competitive atmosphere while also providing the appropriate resources (technical expertise and infrastructure) required for implementing cloud services, top management support is crucial. Organizations that have this support are more able to overcome internal obstacles and change resistance. It is acknowledged that top management must be aware of the potential advantages of implementation of CC to manage future organizational change through an expressed vision and commitment, giving encouraging signals of faith in the new technology to all company personnel. To use CC in RCSs, it is also advised that regulations on data security and protection be established, along with methods for their enforcement.

The context of the environment includes the general area in which an organization operates, such as the components of the industry market and the availability of technology service providers. For instance, competitive pressure is emphasized as a very strong incentive and adoption driver and refers to the intensity and pressure levels encountered by firms from their "same industry" competitors.

The adoption of CC technology is also significantly influenced by the legal environment. Instead, laws

and rules ought to support companies and organizations by establishing a framework that is permissive and helps them shift their data and services to the cloud securely and easily. The findings also demonstrate the need for strong top management backing when introducing CC in any firm in RCSs. Top management is essential since the usage of CC may change the organization's organizational and technological structure. Since data is kept in the cloud, legal action may be necessary to resolve concerns about personal privacy.

According to this data, CC adoption is still in its early stages and is low in places with scarce resources. The majority of RCSs also follow strict guidelines to properly engage in the cloud economy. The difficulties affecting the adoption of CC in resource-constrained environments must vary depending on a region's level of development and the business and communications contexts. The cost of communication still poses a significant obstacle to the uptake of cloud services in many areas with few resources. Since it benefits enterprises, governments, and end users in many ways, CC is especially advantageous in regions with scarce resources. Several challenges need to be overcome to simplify things and promote the usage of CC in these areas. In conclusion, these three characteristics show both advantages and downsides for the adoption of CC depending on the organizational, technological, and environmental circumstances. Clearly, literature has emphasized CC usage generally and in several industries. The chances and difficulties that affect CC adoption in RCSs have been identified with the aid of this review study. The adoption of CC technology has been fraught with difficulties; as a result, pertinent industry-specific issues that affect adoption choices also need to be investigated and examined.

Figure 5 outlines the areas that RCSs should pay attention to as they embrace CC technology. Technical Environment: Aspects like relative benefit, security concern, and compatibility are all covered by the technical context. Some research supports the importance of relative advantage in the adoption of CC. The technical expertise necessary to comprehend CC, a relatively new technology, and its intricate billing procedures may be to blame for this unfavorable association. According to recent studies, security issues had a substantial impact on the adoption of CC as well. These earlier studies stressed how crucial security is for an innovation's uptake. Because of the potential consequences of a breach, CC adopters must take a thorough look at the security

of data, systems, and service providers. In light of this, its prominence as a determinant seems appropriate. Compatibility has already been identified as a key factor in CC adoption. Thus, RCSs can then perceive CC to be compatible with existing systems. Environmental Context: Aspects like competitive pressure, pressure from trading partners, and regulatory support make up the environmental context. Regulation's influence on CC computing adoption was minimal, and the main determinants were pressure from competitors and trading partners. Previous studies have also shown that competitors and business partners are important variables impacting technology adoption. The results of the study corroborate this claim as well. IT adoption has the potential to alter the competitive landscape and provide a business with new operational and competitive advantages. Conversely, a company can experience pressure from its trading partners to implement an innovation in order to maintain a cooperative relationship. Organizational Context: This includes elements like scope, top management support, and technological preparedness that formed the organizational backdrop for the adoption of CC. The investigation revealed that senior management support and technological preparedness were the issues that had the biggest effects on RCSs' adoption of CC. Senior management support is crucial since implementing new technologies may require reengineering business processes and allocating resources. Therefore, senior management support is crucial for the adoption of CC.

5.1 Limitations of the study
This article has some limitations. It excluded white papers, magazine articles, and scholarly articles from databases other than the seven reviewed, as well as those identified through forward and backward search, all of which could have provided additional insights into the challenges of using CC in RCSs. The study was limited to academic publications, using only the article title as the search criterion instead of potentially more insightful abstracts. The narrow search terms excluded terminology such as 'application service provision' or 'utility computing', which might have omitted relevant studies.

Furthermore, the majority of the sources analyzed were from scholarly journals, which could miss significant contributions from prestigious professional publications heavily influenced by industry trends. This may hinder the article from offering a comprehensive overview of the latest developments in this area. The review exclusively

featured peer-reviewed journal articles, possibly overlooking the diversity of conference paper themes related to CC.

The scope of this SLR was restricted to journals, conferences, and book chapters. Future research can consider including a broader range of sources such as dissertations and electronic media like online journals and newspapers. Although efforts were made to gather all relevant material to address the study questions, challenges arose in extracting information from some publications, leading to the exclusion of articles without pertinent data.

The limited focus on CC adoption in resource-poor settings may constrain the applicability of the study's findings and hinder a comprehensive understanding of all facets of CC adoption. Evaluated research

studies may contain biases and confounding factors, such as funding sources or external influences not considered in the study design.

The size and origin of some databases were also limitations, though the selected sources provided a substantial selection. However, given the rapid pace of this field, new research and technologies could soon outdate these findings. The duration of the search was predefined, suggesting the possibility of a more detailed, feature-specific review paper in the future.

Acknowledging these limitations is crucial for guiding future research in sustainable CC and encouraging more reliable and consistent methods for assessing CC's environmental impact in RCSs. A complete list of abbreviations is listed in *Appendix I.*
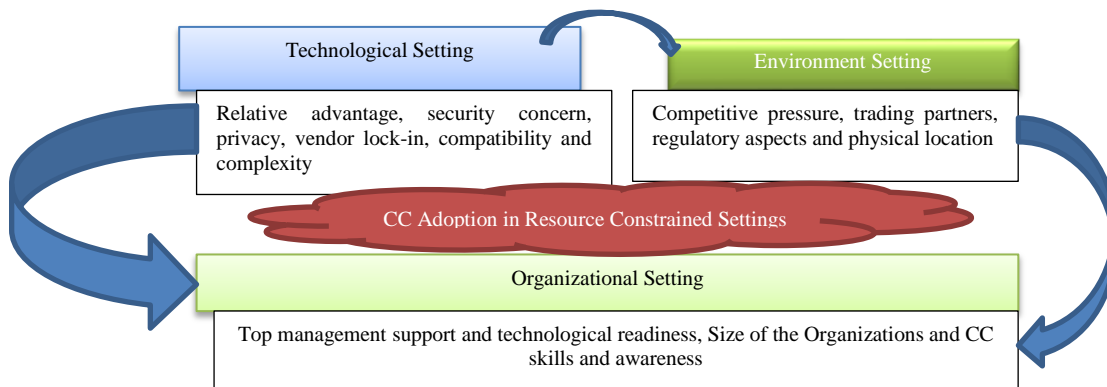

Figure 5 Visual representation succinctly illustrating the proposed areas towards CC adoption by RCSs

6.Conclusion and future work

This research contributes to filling the literature gap in CC adoption. With the aid of SLRA, the adoption of CC in RCSs is examined and compared. Findings from this research show that, whilst challenges like technological, environmental, and organizational draw a lot of concern when considering adoption, they impact and influence adoption decisions and transitioning to the cloud in different ways by RCSs. CC lessens the requirement for RCSs to invest in IT infrastructure by providing access to hardware, computing resources, apps, and services on a pay-per-use basis. This decreases the cost considerably and facilitates the adoption of this innovative technology. The CC has several options for business, education, and healthcare, but to be accepted by the general public or the market, it must have the highest level of security. This paper examines the advantages and disadvantages of CC across several businesses. Users may have several opportunities to cutting-edge technologies like CC in RCSs. Applications that are

delivered and accessible through internet-like services are included in CC, as well as the software and hardware that provide the services.

The study's findings offer a strong foundation for further research as well as an informative view of how CC is developing, given that it is still in its infancy and functioning in a resource-constrained context. Even if CC adoption is still in its early stages in regions with limited resources, policymakers shouldn't waste any time expanding their knowledge of how it might impact their communities and economies to have the evidence they need to make informed decisions. The conceptualization of the diagrammatic portrayal of the author's observation for CC adoption in the RCSs can be the focus of a future section of this study. Future research should be undertaken using variables including technology readiness, top management support, complexity, relative advantage, competitive pressure, compatibility, and data security since these are the

most common facts connected to CC adoption across different settings. Future studies on the factors driving CC adoption by RCSs should combine theoretical frameworks such as the unified theory of acceptance and use of technology (UTAUT), DOI, and technology acceptance model (TAM) to better explain the diversity.

Conflicts of interest

The authors have no conflicts of interest to declare.

References

[1] Sharma SK, Al-badi AH, Govindaluri SM, Al-kharusi MH. Predicting motivators of cloud computing adoption: a developing country perspective. Computers in Human Behavior. 2016; 62:61-9.

[2] Al-malah DK, Aljazaery IA, Alrikabi HT, Mutar HA. Cloud computing and its impact on online education. In IOP conference series: materials science and engineering 2021 (pp. 1-15). IOP Publishing.

[3] Senyo PK, Effah J, Addae E. Preliminary insight into cloud computing adoption in a developing country. Journal of Enterprise Information Management. 2016; 29(4):505-24.

[4] Almazroi AA, Shen H. Adoption of cloud computing services by developing country students: an empirical study. In recent trends in data science and soft computing: proceedings of the 3rd international conference of reliable information and communication technology (IRICT 2018) 2019 (pp. 912-27). Springer International Publishing.

[5] Al-dwairi RM, Al-tweit N, Zyout K. Factors influencing cloud-computing adoption in small and medium e-commerce enterprises in Jordan. In proceedings of the 2018 1st international conference on internet and e-business 2018 (pp. 73-8). ACM.

[6] Nazareth DL, Choi J. Market share strategies for cloud computing providers. Journal of Computer Information Systems. 2021; 61(2):182-92.

[7] Verma P, Gupta MM, Agarwal MA, Gupta S. Blockchain technologies new and forthcoming cloud computing. Booksclinic Publishing; 2023.

[8] Formal CV, Blog I, Blog SR. Cloud computing: the concept, impacts and the role of government policy. 2014.

[9] Ng'ambi D, Bozalek V. Learning with technologies in resource-constrained environments. The Wiley Handbook of Learning Technology. 2016:200-20.

[10] Kattepur A, Dohare H, Mushunuri V, Rath HK, Simha A. Resource constrained offloading in fog computing. In proceedings of the 1st workshop on middleware for edge clouds & cloudlets 2016 (pp. 1-6). ACM.

[11] Stergiou C, Psannis KE, Kim BG, Gupta B. Secure integration of IoT and cloud computing. Future Generation Computer Systems. 2018; 78:964-75.

[12] Chang V, Walters RJ, Wills GB. Organisational sustainability modeling-an emerging service and analytics model for evaluating cloud computing adoption with two case studies. International Journal of Information Management. 2016; 36(1):167-79.

[13] Golightly L, Chang V, Xu QA, Gao X, Liu BS. Adoption of cloud computing as innovation in the organization. International Journal of Engineering Business Management. 2022; 14:1-17.

[14] Velinov A, Zdravev Z, Nikolova A. Optimization of cloud costs. South East European Journal of Sustainable Development. 2023; 7(1):1-8.

[15] Saini H, Upadhyaya A, Khandelwal MK. Benefits of cloud computing for business enterprises: a review. In proceedings of international conference on advancements in computing & management (ICACM) 2019 (pp. 1003-7).

[16] Gangwar H, Date H, Ramaswamy R. Understanding determinants of cloud computing adoption using an integrated TAM-TOE model. Journal of Enterprise Information Management. 2015; 28(1):107-30.

[17] Ruparelia NB. Cloud computing. Cambridge, MA: Mit Press; 2016.

[18] Mulholland A, Pyke J, Fingar P. Enterprise cloud computing: a strategy guide for business and technology leaders. Meghan-Kiffer Press; 2010.

[19] Kadhim QK, Yusof R, Mahdi HS, Ali ASS, Selamat SR. A review study on cloud computing issues. In journal of physics: conference series 2018 (pp. 1-10). IOP Publishing.

[20] Lele A. Cloud computing: disruptive technologies for the militaries and security, smart innovation, Systems and Technologies, 2019.

[21] Yoo SK, Kim BY. The effective factors of cloud computing adoption success in organization. The Journal of Asian Finance, Economics and Business. 2019; 6(1):217-29.

[22] Mandal AK, Sarkar A. Modelling of business processes for software as a service. International Journal of Business Process Integration and Management. 2017; 8(2):81-101.

[23] Wang L, Ranjan R, Chen J, Benatallah B. Cloud computing: methodology, systems, and applications. CRC Press; 2017.

[24] Karmakar A, Raghuthaman A, Kote OS, Jayapandian N. Cloud computing application: research challenges and opportunity. In international conference on sustainable computing and data communication systems (ICSCDS) 2022 (pp. 1284-9). IEEE.

[25] Aletabi H, Abdallah M. A proposed cloud quality model (IaaSQual) for "infrastructure as a service (IaaS)" from user's perspective. In international conference on information technology (ICIT) 2023 (pp. 695-9). IEEE.

[26] Jakovleski D. Anticipated developments in cloud services with a focus on the infrastructure-as-a-service (IaaS) model. Journal of Electrical Engineering and Information Technologies. 2023:29-38.

[27] Taleb N, Mohamed EA. Cloud computing trends: a literature review. Academic Journal of interdisciplinary studies. 2020; 9(1):91-104.

[28] Bello SA, Oyedele LO, Akinade OO, Bilal M, Delgado JM, Akanbi LA, et al. Cloud computing in construction industry: use cases, benefits and challenges. Automation in Construction. 2021; 122:1-18.

[29] Marinescu DC. Cloud computing: theory and practice. Morgan Kaufmann; 2022.

[30] Karim F. Cloud computing-based M-Government. Informatica. 2022; 46(5).

[31] Ibrahim IM. Task scheduling algorithms in cloud computing: a review. Turkish Journal of Computer and Mathematics Education (TURCOMAT). 2021; 12(4):1041-53.

[32] Odeh M, Garcia-perez A, Warwick K. Cloud computing adoption at higher education institutions in developing countries: a qualitative investigation of main enablers and barriers. International Journal of Information and Education Technology. 2017; 7(12):921-7.

[33] Karim F, Rampersad G. Cloud computing in education in developing countries. Computer and Information Science. 2017; 10(2):87-96.

[34] Nieto DM, Quiroz EA, Lengua MA. A systematic literature review on support vector machines applied to regression. In sciences and humanities international research conference (SHIRCON) 2021 (pp. 1-4). IEEE.

[35] Prabowo YD, Kristijantoro AI, Warnars HL, Budiharto W. Systematic literature review on abstractive text summarization using kitchenham method. ICIC Express Letters, Part B: Applications. 2021; 12(11):1075-80.

[36] Wahono RS. A systematic literature review of software defect prediction. Journal of Software Engineering. 2015; 1(1):1-6.

[37] Stenberg K, Hanssen O, Edejer TT, Bertram M, Brindley C, Meshreky A, et al. Financing transformative health systems towards achievement of the health sustainable development goals: a model for projected resource needs in 67 low-income and middle-income countries. The Lancet Global Health. 2017; 5(9):e875-87.

[38] Alam T. Cloud computing and its role in the information technology. IAIC Transactions on Sustainable Digital Innovation (ITSDI). 2020; 1(2):108-15.

[39] Thavi RR, Narwane VS, Jhaveri RH, Raut RD. To determine the critical factors for the adoption of cloud computing in the educational sector in developing countries–a fuzzy dematel approach. Kybernetes. 2022; 51(11):3340-65.

[40] Katal A, Dahiya S, Choudhury T. Energy efficiency in cloud computing data centers: a survey on software technologies. Cluster Computing. 2023; 26(3):1845-75.

[41] Wulf F, Westner M, Strahringer S. Cloud computing adoption: a literature review on what is new and what we still need to address. Communications of the Association for Information Systems. 2021; 48(1):44.

[42] Makena JN. Factors that affect cloud computing adoption by small and medium enterprises in Kenya. International Journal of Computer Applications Technology and Research. 2013; 2(5):517-21.

[43] Swanepoel D, Clark JL. Hearing healthcare in remote or resource-constrained environments. The Journal of Laryngology & Otology. 2019; 133(1):11-7.

[44] Khayer A, Jahan N, Hossain MN, Hossain MY. The adoption of cloud computing in small and medium enterprises: a developing country perspective. VINE Journal of Information and Knowledge Management Systems. 2021; 51(1):64-91.

[45] Alnumay WS. A brief study on software as a service in cloud computing paradigm. Journal of Engineering and Applied Sciences. 2020; 7(1):1-5.

[46] Diaby T, Rad BB. Cloud computing: a review of the concepts and deployment models. International Journal of Information Technology and Computer Science. 2017; 9(6):50-8.

[47] Velte AT, Elsenpeter PD. Cloud computing. Heidelberg: Springer. 2010.

[48] Touray A, Salminen A, Mursu A. ICT barriers and critical success factors in developing countries. The Electronic Journal of Information Systems in Developing Countries. 2013; 56(1):1-7.

[49] Rappert B, Bezuidenhout L. Data sharing in low-resourced research environments. Prometheus. 2016; 34(3-4):207-24.

[50] Foster D, White L, Adams J, Erdil DC, Hyman H, Kurkovsky S, et al. Cloud computing: developing contemporary computer science curriculum for a cloud-first future. In proceedings companion of the 23rd annual conference on innovation and technology in computer science education 2018 (pp. 130-47). ACM.

[51] Mangula IS, Van DWI, Brinkkemper S. Adoption of the cloud business model in Indonesia: triggers, benefits, and challenges. In proceedings of the 14th international conference on information integration and web-based applications & services 2012 (pp. 54-63).

[52] Mohammed F, Ibrahim O, Ithnin N. Factors influencing cloud computing adoption for e-government implementation in developing countries: instrument development. Journal of Systems and Information Technology. 2016; 18(3):297-327.

[53] Boell SK, Cecez-kecmanovic D. On being 'systematic' in literature reviews. Formulating

Research Methods for Information Systems. 2015:48-78.

[54] Paré G, Kitsiou S. Methods for literature reviews. In Handbook of eHealth Evaluation: an Evidence-based Approach [Internet] 2017. University of Victoria.

[55] Selçuk AA. A guide for systematic reviews: PRISMA. Turkish Archives of Otorhinolaryngology. 2019; 57(1):57-8.

[56] Dikert K, Paasivaara M, Lassenius C. Challenges and success factors for large-scale agile transformations: a systematic literature review. Journal of Systems and Software. 2016; 119:87-108.

[57] Munn Z, Peters MD, Stern C, Tufanaru C, Mcarthur A, Aromataris E. Systematic review or scoping review? guidance for authors when choosing between a systematic or scoping review approach. BMC Medical Research Methodology. 2018; 18:1-7.

[58] Rad BB, Diaby T, Rana ME. Cloud computing adoption: a short review of issues and challenges. In proceedings of the 1st international conference on e-commerce, E-business and E-government 2017 (pp. 51-5).

[59] Ali MB, Wood-harper T, Mohamad M. Benefits and challenges of cloud computing adoption and usage in higher education: a systematic literature review. International Journal of Enterprise Information Systems (IJEIS). 2018; 14(4):64-77.

[60] M'rhaoaurh I, Okar C, Namir A, Chafiq N. Challenges of cloud computing use: a systematic literature review. In MATEC web of conferences 2018 (pp. 1-9). EDP Sciences.

[61] Salleh NA, Hussin H, Suhaimi MA, Ali AM. A systematic literature review of cloud computing adoption and impacts among small medium enterprises (SMEs). In international conference on information and communication technology for the Muslim world (ICT4M) 2018 (pp. 278-84). IEEE.

[62] Budiono F, Lau S, Tibben W. Cloud computing adoption for e-commerce in developing countries: contributing factors and its implication for Indonesia. Cloud Computing Adoption for E-commerce in Developing Countries. 2018.

[63] Oke AE, Kineber AF, Al-bukhari I, Famakin I, Kingsley C. Exploring the benefits of cloud computing for sustainable construction in Nigeria. Journal of Engineering, Design and Technology. 2023; 21(4):973-90.

[64] Yenugula M, Sahoo S, Goswami S. Cloud computing for sustainable development: an analysis of environmental, economic and social benefits. Journal of Future Sustainability. 2024; 4(1):59-66.

[65] Kabra G, Ghosh V, Joshi Y. Factors influencing adoption of cloud computing services in HEIs: a UTAUT approach based on students' perception. International Journal of Business Information Systems. 2023; 42(1):103-22.

[66] Nyachiro A, Ondimu K, Mafura G. Adoption strategy for cloud computing in research institutions: a structured literature review. Journal of Computer and Communications. 2023; 11(4):63-78.

[67] Ullah RM. An empirical study of establishing guidelines for evaluation and adoption of secure and cost effective cloud computing. University of Wolverhampton. 2023.

[68] Won D, Hwang BG, Binte MSNK. Cloud computing adoption in the construction industry of Singapore: drivers, challenges, and strategies. Journal of Management in Engineering. 2022; 38(2):05021017.

[69] Elhusseiny HM, Crispim J. SMEs, Barriers and opportunities on adopting Industry 4.0: a review. Procedia Computer Science. 2022; 196:864-71.

[70] Raza SA, Khan KA. Knowledge and innovative factors: how cloud computing improves students' academic performance. Interactive Technology and Smart Education. 2022; 19(2):161-83.

[71] Sadeeq MM, Abdulkareem NM, Zeebaree SR, Ahmed DM, Sami AS, Zebari RR. IoT and cloud computing issues, challenges and opportunities: a review. Qubahan Academic Journal. 2021; 1(2):1-7.

[72] Chen W, Liu B, Huang H, Guo S, Zheng Z. When UAV swarm meets edge-cloud computing: the QoS perspective. IEEE Network. 2019; 33(2):36-43.

[73] Bainomugisha E, Mwotil A. Crane cloud: a resilient multi-cloud service abstraction layer for resource-constrained settings. Development Engineering. 2022; 7:100102.

[74] Puthal D, Sahoo BP, Mishra S, Swain S. Cloud computing features, issues, and challenges: a big picture. In international conference on computational intelligence and networks 2015 (pp. 116-23). IEEE.

[75] Ta AD. A cloud computing adoption framework for developing countries. In sustainable ICT adoption and integration for socio-economic development 2017 (pp. 175-99). IGI Global.

[76] Vajjhala NR, Ramollari E. Big data using cloud computing-opportunities for small and medium-sized enterprises. European Journal of Economics and Business Studies. 2016; 2(1):130-8.

[77] Hasimi L, Penzel D. A case study on cloud computing: challenges, opportunities, and potentials. In developments in information and knowledge management systems for business applications. 2023 (pp. 1-25). Cham: Springer Nature Switzerland.

[78] Kero A, Arora M, Sharma V, Makkar GD, Semwal P, Sharma HC. The implementation of cloud computing as strategic technology for sustainable development using regression analysis. Journal of Contemporary Issues in Business and Government. 2023; 29(2):162-9.

[79] Hassan SR, Rashad M. Cloud computing to fog computing: a paradigm shift. Technology, Management and Integration. 2023.

[80] Hiran KK, Henten A. An integrated TOE–DoI framework for cloud computing adoption in the higher education sector: case study of Sub-Saharan Africa, Ethiopia. International Journal of System Assurance Engineering and Management. 2020; 11:441-9.

[81] Adendorff R, Smuts H. Critical success factors for cloud computing adoption in South Africa. In AMCIS 2019.

[82] Adjei JK, Adams S, Mamattah L. Cloud computing adoption in Ghana; accounting for institutional factors. Technology in Society. 2021; 65:101583.

[83] Dahiru AA, Abubakar H. Cloud computing adoption: a cross-continent overview of challenges. Nigerian Journal of Basic and Applied Sciences. 2017; 25(1):23-31.

[84] Van ZWR, Henning S, Van DPJA. A framework for knowledge management system adoption in small and medium enterprises. Computers. 2022; 11(9):128.

[85] Amron MT, Ibrahim R, Bakar NA, Chuprat S. Determining factors influencing the acceptance of cloud computing implementation. Procedia Computer Science. 2019; 161:1055-63.

[86] Scholtz B, Govender J, Gomez JM. Technical and environmental factors affecting cloud computing adoption in the South African public sector. In international conference on information resources management (CONF-IRM) 2016 (pp. 1-14). AIS Electronic Library.

[87] Hassan H, Nasir MH, Khairudin N, Adon I. Factors influencing cloud computing adoption in small medium enterprises. Journal of Information and Communication Technology. 2017; 16(1):21-41.

[88] Singh J, Mansotra V. Factors affecting cloud computing adoption in the Indian school education system. Education and Information Technologies. 2019; 24(4):2453-75.

[89] Jianwen C, Wakil K. A model for evaluating the vital factors affecting cloud computing adoption: analysis of the services sector. Kybernetes. 2020; 49(10):2475-92.

[90] Mohammad SM. Cloud computing in it and how it's going to help United States specifically. International Journal of Computer Trends and Technology (IJCTT). 2019; 67(10):103-9.

[91] Amini M, Jahanbakhsh JN. A multi-perspective framework established on diffusion of innovation (DOI) theory and technology, organization and environment (TOE) framework toward supply chain management system based on cloud computing technology for small and medium enterprises. International Journal of Information Technology and Innovation Adoption. 2023; 11:1217-34.

[92] Razi M, Batan A. Opportunities and challenges of cloud computing in developing countries. Artificial Intelligence in Society. 2023; 3(1):1-8.

[93] Yakubu AS, Kassim AM, Husin HM. Exploring the empirical studies of cloud computing adoption in anglophone West African countries' academic libraries: a review. In international conference on mathematical and statistical physics, computational science, education, and communication (ICMSCE 2022) 2023 (pp. 90-103). SPIE.

[94] Gupta A, Mazumdar BD, Mishra M, Shinde PP, Srivastava S, Deepak A. Role of cloud computing in management and education. Materials Today: Proceedings. 2023; 80:3726-9.

[95] Li C, Pan B, Xiang Z, Zhang L, Chen L, Chen D. Improving the scalability of algebraic multigrid through cloud computing. World Journal of Technology and Scientific Research. 2023; 12(2023):98-103.

[96] Yakubu AS, Kassim AM, Husin MH. Conceptualizing hybrid model for influencing intention to adopt cloud computing in North-Eastern Nigerian academic libraries. The Journal of Academic Librarianship. 2023; 49(4):102747.

[97] Alarefi M. Cloud computing usage by governmental organizations in Saudi Arabia based on vision 2030. Uncertain Supply Chain Management. 2023; 11(1):169-78.

[98] Weinman J. Cloudonomics+ website: the business value of cloud computing. Wiley Online Library; 2023.

[99] George DA, George AH. Potential risk: hosting cloud services outside the country. International Journal of Advanced Research in Computer and Communication Engineering. 2022; 11(4):5-11.

[100] Cresswell K, Domínguez HA, Williams R, Sheikh A. Key challenges and opportunities for cloud technology in health care: semistructured interview study. JMIR Human Factors. 2022; 9(1):e31246.

[101] Pallathadka H, Sajja GS, Phasinam K, Ritonga M, Naved M, Bansal R, et al. An investigation of various applications and related challenges in cloud computing. Materials Today: Proceedings. 2022; 51:2245-8.

[102] Lutfi A. Understanding the intention to adopt cloud-based accounting information system in jordanian SMEs. International Journal of Digital Accounting Research. 2022; 22.

[103] Skafi M, Yunis MM, Zekri A. Factors influencing SMEs' adoption of cloud computing services in Lebanon: an empirical analysis using TOE and contextual theory. IEEE Access. 2020; 8:79169-81.

[104] Almaiah MA, Al-khasawneh A. Investigating the main determinants of mobile cloud computing adoption in university campus. Education and Information Technologies. 2020; 25:3087-107.

[105] Manda MI, Ben DS. Responding to the challenges and opportunities in the 4th industrial revolution in developing countries. In proceedings of the 12th international conference on theory and practice of electronic governance 2019 (pp. 244-53). ACM.

[106] Tabrizchi H, Kuchaki RM. A survey on security challenges in cloud computing: issues, threats, and solutions. The Journal of Supercomputing. 2020; 76(12):9493-532.

[107] Njenga K, Garg L, Bhardwaj AK, Prakash V, Bawa S. The cloud computing adoption in higher learning institutions in Kenya: Hindering factors and recommendations for the way forward. Telematics and Informatics. 2019; 38:225-46.

[108] Rajabion L, Shaltooki AA, Taghikhah M, Ghasemi A, Badfar A. Healthcare big data processing mechanisms: the role of cloud computing. International Journal of Information Management. 2019; 49:271-89.

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Appendix I

S. No.	Abbreviation	Description
1	CC	Cloud Computing
2	CPU	Central Processing Unit
3	DOI	Diffusion of Innovation
4	GC	Grid Computing
5	IaaS	Infrastructure As A Service
6	IT	Information Technology
7	ICT	Information And Communication Technology
8	NIST	National Institute of Standards And Technology
9	OLPC	One-Laptop-Per-Child
10	OSs	Operating Systems
11	PaaS	Platform As A Service
12		
13	RCSs	Resource-Constrained Settings
14	SLRA	Systematic Literature Review Analysis
15	PRISMA	Preferred Reporting Items For Systematic Reviews And Meta-analyses
16	PC	Personal Computer
17	SaaS	Software As A Service
18	SQ	Study Question
19	SLR	Systematic Literature Reviews
20	TAM	Technology Acceptance Model
21	TLR	Traditional Literature Reviews
22	UTAUT	Unified Theory of Acceptance and Use of Technology