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THE HISTORY OF CLOUD COMPUTING IN SAUDI ARABIA

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ABSTRACT

Cloud technology is an increasingly influential information technology pattern across the globe, and cloud computing technology has been adopted in several developing countries. This emerging technology has enhanced government functions in sectors including business, education and health care. The Kingdom of Saudi Arabia (KSA) is still in the early stages of engaging with this technology, with some research into adoption. This paper reviews the literature concerning the history of cloud computing in Saudi Arabia, including the launch of internet connectivity and community buy-in to the concept of the cloud. Further, this review considers how Saudi Arabian authorities, sectors and companies have implemented cloud technology in relation to consumers and end-users. This paper also examines some key issues encountered in Saudi Arabian context, such as adoption and security.

KEYWORDS: Cloud Computing; Sustainable Development Goals (SDGs); Saudi Arabia; Sustainability; Green Computing; SDG 9: Industry, Innovation and Infrastructure; SDG 13: Climate Action; Carbon Emissions; Technology Adoption; Digital Transformation; Economic Feasibility; Green Energy.

1. INTRODUCTION

Since the establishment of the Kingdom of Saudi Arabia under the reign of King Abdul-Aziz, Saudi Arabia has been interested in its technological development. The first breakthrough in this area was when Russian authorities contributed to installing wireless means and a 20-nation radio station as a gift to the Saudi government in 1934 (Alshbaili, 2002; R. Arabic, 2016). The internet services officially entered Saudi Arabia in March 1997 (Al-Hajery, 2004). Several studies have revealed that the main reasons for the delayed adoption of the internet related to governmental concerns around security, the potential impact on the Islamic context, and preserving morality and culture (Alshahrani, 2016). After adoption, the Internet was controlled by Saudi authorities and the Internet service provider (ISP) was subject to 24-hour monitoring through the King Abdul-Aziz City for Science and Technology (Atwan, 2008; Zittrain & Palfrey, 2007). Saudi citizens and residents had to pass internet traffic through a single gateway with a technical filtering mechanism that prevented access to forbidden pages, such as those deemed to contravene Saudi laws or violate Islamic law and values (Cordesman, 2003; Kalathil & Boas, 2003; Zittrain & Palfrey, 2007). With time, Saudis became more knowledgeable about how to engage with the internet and its affordances, and found ways of achieving access that the country had not yet approved (Hammond, 2007; Johnson, 2001). Currently, data generated by the Ministry of Information indicates that internet access in Saudi Arabia has increased by at least 20 per cent every year, that an estimated 83 per cent of internet users are aged between 20 and 35, and that adult males account for over 78 per cent of all internet users in the kingdom (Sakr, 2004).

In 2002, the concept of cloud computing applications started to emerge in Saudi Arabia. This is possibly due to the widespread impact of viruses and worms in storage devices like hard discs, flash memory drives and CDs, especially when transferring files computer-to-computer or via web browsers (Levine & Young, 2010). Further, these viruses, worms and electronic attacks were a result of using feck and crack programs, also called pirated software; a practice that was spreading widely within the Saudi setting. Moreover, while most pirated software was forbidden by Saudi government, it was virtually impossible to control (Hertog, 2011). As a result, Saudi Arabian users from that era developed a mindset around how to keep private and sensitive files safe. For example, some users emailed files to themselves prefer it into a particular section to

facilitate access information. Subsequently, Saudi citizens started to use 'cyberlocker' or file hosting services and online file storage providers, including famous sites like RapidShare, 4share, Mediafire and 2shared, in addition to well-known Saudi sites that used the Arabic language, such as Taq-Taq and Rofof.

On the other hand, Saudi industrial sectors and technical service providers began to take up cloud computing after the rapid development of internet services from static to dynamic. This shift was due to inconsistencies in new electronic systems which caused temporary disruptions to the system, as well as differences among systems structures. Moreover, end users become more well-informed and required sophisticated and accessible systems (Donaldson, Siegel, Williams, & Aslam, 2015; Mahmood, 2014).

2. METHODOLOGY

2.1. Research Design

This study employed a comprehensive literature review and descriptive analysis design. The methodology is qualitative in nature, focusing on the systematic identification, synthesis, and interpretation of a diverse range of secondary data sources. The objective was to construct a coherent historical narrative of the emergence of cloud computing in the Kingdom of Saudi Arabia (KSA) and to conduct a thematic analysis of the key factors, advantages, and challenges associated with its adoption.

2.2. Research Questions

This review was structured to answer the following implicit research questions:

- RQ1: What is the historical trajectory of internet connectivity and the subsequent emergence of cloud computing in Saudi Arabia, including initial governmental concerns and early user behaviors?
- RQ2: How have Saudi authorities, industrial sectors, and end-users implemented and engaged with cloud technologies over time, and what is the scale of government spending on these services?
- RQ3: What are the key trends in public interest, regional engagement, and common user search terminology regarding cloud computing in the KSA?
- RQ4: What are the primary advantages of cloud computing as identified within the Saudi context?
- RQ5: What are the main factors (e.g.,

technological, organizational, environmental) influencing the adoption of cloud computing across different Saudi sectors, as identified in existing empirical research?

- RQ6: What are the critical security challenges and proposed cost-benefit frameworks associated with cloud implementation in the Kingdom?

3. DATA ANALYSIS

The synthesized data was analyzed using several descriptive and qualitative techniques.

1. Historical Narrative Construction Data from archival sources and early reports were chronologically ordered. This allowed for the construction of a descriptive history tracing the evolution from basic internet access, through early file-hosting usage, to the formal adoption of cloud systems by government and private sectors.
2. Thematic Analysis of Adoption Factors The collated findings from the empirical studies were subjected to a thematic analysis. This involved identifying and mapping the most frequently cited factors influencing cloud adoption. The analysis concluded that usefulness, security, reliability, and quality of service were the major factors identified across the literature.
3. Descriptive Statistical Analysis Quantitative data from CITC reports (e.g., spending figures from 2011-2019) and Google Trends (e.g., regional interest ratios) were reproduced and analyzed descriptively. This analysis illustrated the financial growth of the cloud market and highlighted regional disparities in public engagement, noting the Eastern Province and Riyadh as areas of highest interest.
4. Search Query Analysis The corpus of Google search terms was analyzed to provide insights into user intent and market segmentation. The analysis identified distinct user cohorts (informational, commercial, functional, bilingual) and mapped the de facto competitive landscape (Google, Apple, Adobe), informing a strategic analysis of market positioning.
5. Review of Frameworks and Challenges Finally, the literature concerning specific challenges was synthesized. This included a review of a cost-benefit analysis framework and a thematic summary of key security issues (e.g., data sensitivity, encryption,

authentication).

4. HISTORY OF CLOUD COMPUTING IN SAUDI ARABIA

In recent years, as large companies such as Amazon, Google and Microsoft launched the cloud system, Saudi citizens and some private sector industries started to use cloud applications such as Google documents (Alshihri, 2017).

Cloud vendors (also referred to as cloud service providers) were quick to provide cloud service before the legislation governing cloud operation was enacted. For example, in 2012 Go and Awal launched the region's first software for cloud computing partners to integrate cloud computing solutions into a virtual community (Alotaibi, 2019).

As a result of these advancements, Saudi Arabia entrusted the Ministry of the Interior with the highest directives to implement cloud computing with the cooperation of some ministries and the military. Al-Shady, who is in charge of technical services at the Ministry of Interior, observed that cloud computing in Saudi Arabia "is no longer an option, it is a strategic destiny" (A. Arabic, 2016).

While there was arguably little coherence in the implementation process, the intent was that these bodies would cooperate to:

- Investigate global best practices in the control and delivery of cloud computing
- Identify the requirements of adopting the national governmental cloud as a national platform for the government sector
- Investigate the transfer of information centres in government organisations to the national cloud
- Investigate the impact of the transformation of the public cloud on the private sector and how to benefit from it
- Prepare legislation and policies
- Develop licensing, regulation and control controls to provide computing services.

In response, the Communications and Information Technology Commission (CITC) published an organisational guide for cloud computing in Saudi Arabia, as well as a guide for cloud computing services in government departments. It must, however, be borne in mind that these documents are subject to change by the State and the Panel of Experts for enhancing the statutory protection and attracting foreign investment (Mckenzie, 2019).

The CITC published its first report on the use and implementation of cloud computing in 34 government and private sector corporations (CITC,

2015). The report revealed that Saudi Arabia spent 189 million riyals on cloud computing services from 2011 to 2014. The report indicated expectations of government spending in the coming years until 2019 (CITC, 2015) (see Figure 1).

Size of spending in Cloud computing in Saudi Arabia

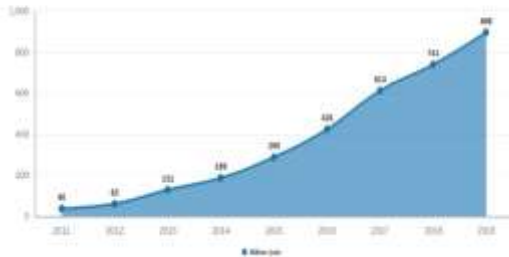


Figure 2: The Communications And Information Technology Commission (CITC, 2015).

The report pointed out that cloud services are moving to a practical stage which mean that people in Saudi trying to apply cloud computing in their life. SaaS is the most widely used at 21%, likely because it is the easiest to use and most common in global trends such as mail systems, accounting, human resource management and public relations management (CITC, 2015). The report also noted that in the future, use of IaaS will likely be higher than SaaS. In 2014, the Ministry of Technology Information and Communication (MCIT) similarly indicated a 35% growth in spending on cloud services in the kingdom during 2016 (MCIT, 2014a).

The Communications and Information Technology Commission (CITC) stated as in Figure 2 that most organisations plan to adopt IaaS in the near future (CITC, 2015). Other surveys indicate that ultimately, 90% of government agencies will adopt hybrid cloud computing (MCIT, 2014b). Another report found that, in the near future, the regulation of cloud computing will increase investment in infrastructure and localisation of computing services (CITC, 2017). Saudi Arabia's approach to cloud computing confirms that the Crown prince has met the founders of Google and is considering options for adopting electronic cloud and artificial intelligence (SPA, 2018).

One of these cloud technologies in Saudi Arabia is Deam cloud computing. Deem is a government cloud computing platform established by Royal Decree in September 2018. It aims to empower government and semi-government entities with fast, reliable, flexible, and efficient technological resources to accelerate digital transformation and enhance the quality of technological services across the Kingdom

(SADAIA, 2025).

Use of cloud computing and expected uses

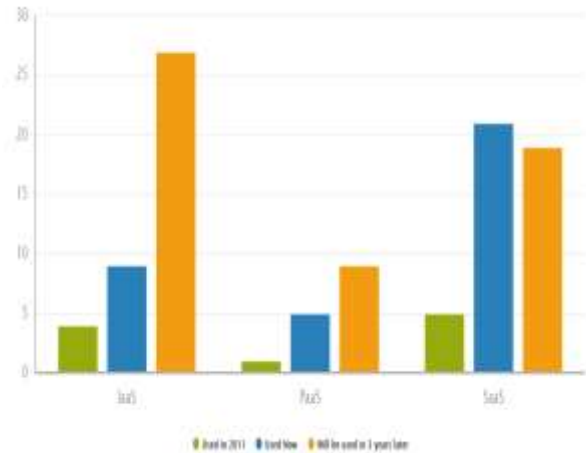


Figure 1: The Communications and Information Technology Commission. (CITC, 2015)

Google Trend's statistics indicated that there has been a gradual rise of interest reading and learning in cloud computing between 2015 and 2025. These indicators are most likely foundational to the research into and general interest in cloud services in Saudi Arabia in general see figure 3.

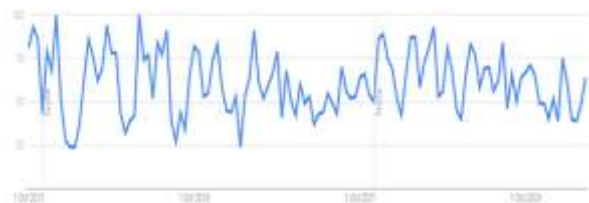


Figure 3: Indicators of interest about cloud computing in Saudi Arabia between 2015 - 2025 (Google Trend, 2025).

The following table indicates the number of governmental regions whose population is considering cloud computing services. The following table represents the interest of each region. This table is reflective of the expected readiness of each sector, taking into account the cities that already possess the necessary infrastructure.

In the following Figure 4, shows the degree of interest in cloud among of provinces in Saudi Eastern Province and Riyadh province have taken the most

interest in cloud. These data can be helpful to decision makers as they plan national schemes such as launching cloud computing major in Eastern Province or Riyadh province. Additionally, this information supports decision makers to raise awareness and facilitate training in cloud computing in less interested areas such as Tabuk Province.

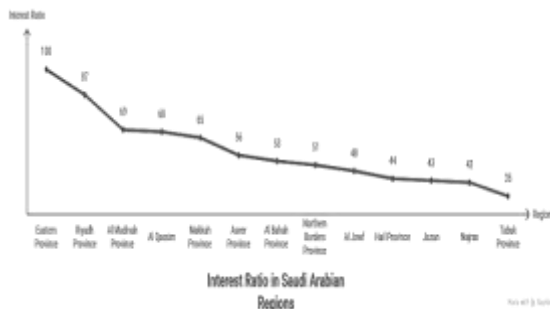


Figure 4: The Degree of interest in cloud computing among the regions of Saudi Arabia (Google trend, 2025).

A differentiated strategic framework, informed by the provided engagement statistics, is imperative for optimizing resource allocation across Saudi Arabia's administrative regions. The main regions, specifically the Eastern Province (100) and Riyadh Province (87), exhibit the highest engagement ratios and thus warrant maximal prioritization. Strategies in these zones should transcend simple market penetration to focus on enhancing user engagement, loyalty, and retention, while also serving as primary test markets for new initiatives. The subsequent regions, encompassing Al Madinah (69), Al Qassim (68), and Makkah (65), represent significant growth opportunities. These "warm" markets necessitate targeted campaigns aimed at converting latent interest into active user acquisition, leveraging and localizing proven strategies from the main regions. For the remaining regions with moderate to low engagement (from Aseer at 56 down to Tabuk at 35), a root-cause analysis is the immediate strategic priority. This investigation must ascertain the underlying factors contributing to attenuated interest, such as deficits in brand awareness, suboptimal product-market fit, or logistical impediments. Initial interventions in these lower-tier markets should prioritize foundational brand building and agile, low-cost pilot programs to validate market viability prior to significant capital expenditure. In essence, while the quantitative data elucidates what regional disparities exist, it lacks explanatory power regarding why. Therefore, the critical subsequent phase must involve qualitative research—such as a comparative attitudinal study between high-engagement (Eastern Province) and

low-engagement (Tabuk) cohorts – to uncover causal mechanisms and inform the development of effective, evidence-based market-entry strategies for untapped regions.

Google Trend's statistics indicated that most key word that most common in Saudi Arabia when they looking for the service of cloud (see Table 2).

Table 2: Most Common Words in Searching Engine.

	Most common words in searching engine
1.	cloud
2.	cloud computing
3.	i cloud
4.	google cloud
5.	الحوسبة السحابية
6.	cloud storage
7.	adobe
8.	creative cloud
9.	oracle cloud
10.	adobe creative cloud
11.	icloud
12.	التخزين السحابي
13.	what is cloud computing
14.	الحوسبة السحابية
15.	what is the cloud
16.	cloud print
17.	google drive
18.	realplayer cloud

This search query corpus provides a valuable source of market intelligence, offering critical insights into user intent and the conceptual segmentation of the "cloud" services domain. An academic analysis indicates its utility across four primary areas: 1) segmenting the audience into distinct informational (e.g., "what is the cloud"), commercial/branded (e.g., "iCloud"), functional (e.g., "cloud storage"), and bilingual (e.g., "الحوسبة السحابية") cohorts; 2) mapping the de facto competitive landscape dominated by major ecosystems like Google, Apple, and Adobe; 3) informing a content strategy where queries serve as thematic pillars; and 4) validating high-intent keywords for SEO and SEM. Consequently, a differentiated strategic implementation is recommended. This necessitates, first, the development of a dual-funnel content architecture to engage users at every stage, from top-of-funnel (TOFU) educational pieces to bottom-of-funnel (BOFU) conversion-oriented landing pages. Second, the coexistence of Arabic and English terms mandates a comprehensive bilingual localization strategy that extends beyond direct translation to include original Arabic content and correct technical SEO (e.g., hreflang tags). Third, a "branded-keyword interception" strategy, utilizing long-tail "alternative to" keywords and targeted SEM, should be deployed to position against dominant competitors. Finally,

product marketing and service offerings must be structured around the functional use-cases identified by the market (e.g., "cloud storage," "cloud print") rather than abstract technological labels, thereby aligning the value proposition directly with demonstrated user demand.

4.1. Advantages of Cloud Computing in the Context of Saudi Arabia.

Existing research has found considerable benefits associated with the implementation of cloud computing (Ahson & Ilyas, 2010; Arshdeep & Vijay, 2014; Cheung, Fong, Zhang, Kwan, & Kwok, 2014; Erl, Puttini, & Mahmood, 2013; Furht & Escalante, 2010; Marinescu, 2013a; MCIT, 2014b; Nayar & Kumar, 2015). It is essential to consider these benefits in the context of Saudi Arabia. Lawan and Kashif (2018) pointed out that in context of Saudi Arabia the key advantages of deploying safe cloud computing technology include:

- Decreased costs on technical infrastructure
- Backup and recovery of data
- Automatic support for integration and customization of software
- Globalized access
- Rationalized practices
- Improved accessibility
- Efficient monitoring of schemes
- Decreased need for personnel training
- Minimization of new software licensing requirements

- Improved flexibility

This is consistent with Syed (2016), whose research demonstrated that the key benefits cloud computing technology brings are: reduced start-up prices, extending the visibility of information, technical control of usage, expanding the inter-institution collaboration and integration, and lessening reply times.

4.2. Factors Affecting the Adoption of Cloud Computing in the Saudi Context

In recent decades, the subject of migration of cloud into organizations has been of significant interest to researchers due to development of innovative technologies. Although this subject has been widely explored, little research has focused on Saudi Arabia specifically. The goal of the following section is to capture all the studies that have engaged with adopting cloud computing in different context, manipulating various theories and models. The contribution of this review is to support a more holistic picture for researchers interested in user acceptance or adoption of cloud technology in various Saudi Arabian contexts. As illustrated in Table 1, most research has found that the major factors associated with the adoption of cloud technology are usefulness, security, reliability and quality of service. These factors help decision makers, authorities and another researcher obtain to better implement cloud applications to furnish users with the associated benefits.

Table 1: Summary of Studies in Adoption Cloud, Saudi Arabia

Topic	Authors and year	Framework	Sample	Context	Results
User Acceptance of Cloud Computing in Saudi Arabia	S. T. Alharbi (2012)	TAM2	IT staff working in organizations	IT context	Results confirm a high level of validation of TAM in its standard form. The results also indicated that moderators such as age, education, job domain, and nationality have a significant effect on user attitudes toward the adoption of cloud computing. However, gender was not significant.
Factors Affecting the Adoption of Cloud Computing in the Government Sector: A Case Study of Saudi Arabia	Alsanea & Barth (2015)	Conceptual model	Employees in leading organizations in Saudi Arabia	Governmental context	The study reveals that 85.80% of respondents supported the adoption of cloud computing. Results showed that perceived usefulness, perceived service quality, and security were the most critical factors in the adoption of cloud computing.
Understanding the Determinants of Cloud Computing Adoption in Saudi	F. Alharbi, Atkins, Stanier, & Systems (2016)	Integrated TOE (Technology-Organization-Environment) framework with IS Triangle and HOT-fit model	Employees of public and private healthcare organisations including IT specialists, health professionals, and administrators	Health management context	The study found that the five most important factors influencing adoption are soft financial analysis, relative advantage, hard financial analysis, attitude toward change, and pressure from partners in the business ecosystem.

Topic	Authors and year	Framework	Sample	Context	Results
Healthcare Organisations					
An Exploratory Study for Investigating the Critical Success Factors for Cloud Migration in the Saudi Arabian Higher Education Context	Alharthi, Alassafi, Walters, & Wills (2017)	Critical Success Factors (CSFs)	IT specialists from Saudi universities	IT context	Results show that security and reliability are the most significant factors. Moreover, IT specialists indicate that private and hybrid clouds are most preferred. The research pointed out that internet speed or bandwidth is sufficient to support educational institutions.
An Empirical Study of Factors Influencing Cloud Adoption Among Private Sector Organisations	Alkhatir, Walters, & Wills (2018)	Conceptual model including technological, organisational, environmental, and social factors	IT staff in the private sector with at least two years of experience	Private sector context	Results confirmed that quality of service and trust are the most influential factors in cloud adoption. The physical location of cloud storage significantly impacted compliance with regulation and privacy. The effect differed according to organisation size and between adopters and non-adopters.
Factors Affecting Cloud ERP Adoption in Saudi Arabia: An Empirical Study	AlBar & Hoque (2019)	Combination of Diffusion of Innovation (DOI) theory and Technology-Organization-Environment (TOE) framework	Business operation managers and IT managers	Business context	The study found that factors such as relative advantage, complexity, observability, ICT skills, ICT infrastructure, top management support, and the regulatory environment were significant in influencing cloud adoption, warranting further investigation.
Investigating the Factors Affecting the Adoption of Cloud Accounting in Saudi Arabia's Small and Medium-Sized Enterprises (SMEs)	Mujalli, A., Wani, M. J. G., Almgrashi, A., Khormi, T., & Qahtani, M. (2024)	Integrated model combining Technology Acceptance Model (TAM) and Technology-Organization-Environment (TOE) framework	354 valid responses collected from accountants employed in SMEs	Saudi Arabian SMEs, focusing on accounting technology adoption	The study found that relative advantage, compatibility, complexity, organizational resources, employee capability, top management support, mimetic pressure, normative pressure, perceived usefulness, and perceived ease of use had significant positive impacts on the intention to adopt cloud accounting (Mujalli et al., 2024).
Implementation of Cloud Computing in Saudi Construction: An Exploration of Political, Economic, Social, Technological, Environmental and Legal Factors Using Fuzzy DEMATEL	Alaboud, N. S., & Elmansoury, A. (2025)	PESTEL (Political, Economic, Social, Technological, Environmental, Legal) framework analyzed using the fuzzy DEMATEL method	27 experts from the Saudi construction industry, including contractors, designers, and government/semi-government representatives	Adoption of cloud computing technologies within the Saudi Arabian construction sector	The study found that government policies and economic incentives were the most influential drivers for adopting cloud computing. Technological enablers (e.g., BIM, IoT) were critical, while social factors such as workforce skills and cultural readiness also played a significant role. Environmental and legal factors contributed to sustainability and regulatory compliance (Alaboud & Elmansoury, 2025).

Framework of sustainability and economic feasibility analysis with cloud computing One of

the significant feature of the implementation of cloud computing in organisations is pay as much as you

use. External cloud computing providers approach “pay as you use” in ways that are quite different from traditional financial agreements (Satapathy, Bhateja, & Das, 2018). This can attract businesses to cloud computing because it avoids “under or over provisioning or prior subscription” (Antonopoulos & Gillam, 2010, p272). Moreover, businesses and organizations are particularly interested in the affordances of cloud computing in the contemporary era of sustainability and green energy. By utilizing cloud, for instance, vendors can reduce carbon emissions as well as save up to roughly 13 billion dollars by 2020 (Satapathy, Bhateja, & Das, 2019). Other research similarly indicates that moving into the cloud computing can save a large organization the equivalent of 6,000 vehicles on the road annually. After five years, this would wipe out 30,000 metric tonnes of carbon dioxide (Boone, Kurtz, Khan, & Canzer, 2019).

One of the major issues that impact adoption technology in organisations is economic feasibility analysis. In 2018, Aldahwan and Saleh (2018) developed a new framework for cost-benefit analysis regarding cloud computing adoption by higher education institutions in Saudi Arabia. This framework can help decision-makers in higher education to find the best results of implementing a cloud environment into higher education establishments. The framework for cost-benefit analysis is composed of five layers including cost-based estimations, project specific cost analysis, type of cloud, intangible benefit and data pattern based cost analysis (Aldahwan & Saleh, 2018).

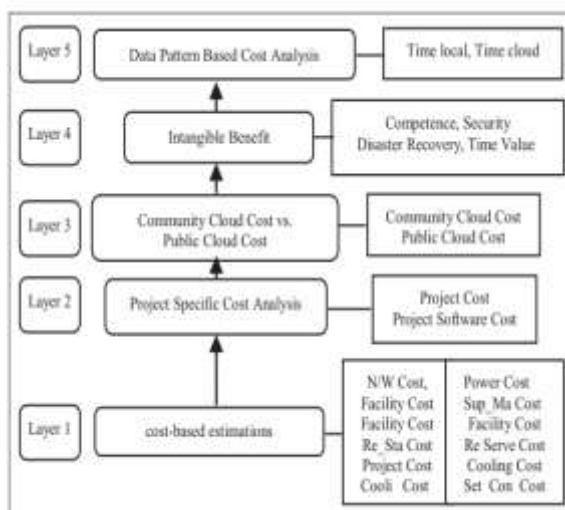


Figure 5: Framework for cost-benefit analysis by (Aldahwan & Saleh, 2018).

Cloud Security in Saudi Arabia

The issue of security in the cloud is one of the most

critical issues related to the implementation of cloud computing (Kevin, Sean, & Mervyn, 2012; Marinescu, 2013b; Subashini & Kavitha, 2011; Vacca, 2016). This issue is complicated by the existence of various cultural and political issues. Saudi Arabia is one of several countries that has adopted the concept of protection, particularly in all electronic transactions. This has been the case since the earliest stages of internet adoption in the country. Security may correspondingly be associated with other concepts such as privacy and protection of data. Lawan and Kashif (2018) have studied the problem of security in Saudi Arabia. This study found that 42% of employees are unaware of whether cloud computing is more or less secure than other forms of digital storage. However, it was also pointed out that there are ways to support the issue of security in cloud computing in Saudi Arabia, including:

- Selection of the cloud deployment model: Administration needs to decide the type of cloud deployment model required e.g., whether it is a public or hybrid cloud.
- The sensitivity of data: All data should be stored or processed in the cloud, and categorized as either sensitive, private, or data that is publicly available to all customers.
- Encryption algorithms: Administration should check the ability of vendors to encrypt data by asking whether the encryption has strong enough to protect data.
- Remote supervising and management of vendor: Administration should clarify the roles of vendor monitor, administer or manage the workstations.
- Personal usage: Administration should discuss the ability for end users to use their own tools for all necessary processes including integrity checking, compliance checking, security monitoring and network management.
- The safety of gateway technologies: Vendors should identify the most suitable technologies to generate a secure gateway setting such as firewalls, traffic flow filters, content filters and antivirus software.
- Authentication: Administration should use appropriate identity and entrance systems.
- Tamper Proof: Administration should make sure that the network will work properly in accordance with internationally acceptable standards.
- Training: Employees should be properly trained to support exploitation of the affordances of cloud technology.

5. CONCLUSION

Previous studies have not previously attributed this review. This paper aims to review the beginning of the operation of the cloud in the Saudi context. This study has indicated the origins of entering the Internet and the development of people's needs for it. Moreover, this review is offering the keywords that insights into user intent and the conceptual segmentation of the "cloud" services domain. The paper included a reading of the reports published in Saudi Arabia in the Arabic language on the use of computing in some institutions. In addition to the large budgets provided by the Saudi government for these services.

Moreover; this review has displayed statistics from Google trend about the use of computing in Saudi Arabia and its spread in many regions. This

study has contributed to the reasons for cloud usage in Saudi society. Furthermore; the factors that are influencing the adoption of the cloud in several local contexts. This paper is reviewing the proposed model with a number of researchers concerning the operation of the cloud in higher education institutions. The findings of this paper provide valuable insights and highlight key issues and inspirations related to the adoption of cloud computing technologies within the context of Saudi Arabia. Moreover, the study offers significant recommendations and suggestions that can contribute to enhancing and facilitating the effective adoption of cloud computing technologies across various sectors and contexts.

Data Availability Statement: All Data supporting the findings of this study are available.

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