

An examination of the organizational factors that influence the decision to adopt cloud computing by Small and Medium Enterprises in Kampala

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Abstract

The paper examined the organizational factors that informed decisions to adopt cloud computing by Small and Medium Enterprises (SMEs) in Kampala, Uganda.

The paper is an outcome of a study conducted in Kampala in 2022. The study was both descriptive and explanatory and relied on the quantitative approach of data collection and analysis. The data were collected from 416 SMEs.

It was found out that the benefits of cloud computing (Mean = 3.68, St. Dev = .773), the relevance of cloud computing to the organization (Mean = 3.58, St. Dev = .649), unreliability of insourced IT services (Mean = 3.74, St. Dev = .916), the need to backup organizational data (Mean = 3.87, St. Dev = .696), managerial support for cloud computing (Mean = 3.29, St. Dev = .900), among others—drove decisions in organizations to adopt cloud computing.

Keywords: Cloud computing, SMEs in Kampala, organizational factors

Introduction

In recent years, an increasing number of firms has realized the benefits of cloud computing and service orientation, not just in terms of cost, but also in terms of scalability. What businesses need are the expertise, organizational structure, and processes necessary to fulfil this promise. Cloud computing, according to Lin and Chen (2012), will put IT professionals' talents to the test.

This is owing to the fact that technological advancements always outpace organizations' ability to adapt and apply them in novel ways, organizations interested in adopting cloud computing are searching for help establishing technology roadmaps to determine (a) which applications are most suited for cloud migration and (b) how to make the changes in the least disruptive way possible (Marston et al.,2011).

As Information Technology as a Service (ITaaS) has become more prevalent, businesses spend less time constructing IT assets and more time orchestrating services; thus, enabling them to successfully consume IT services in their operations, decisions, and innovations (Elias & Mirchandani, 2012).

According to Iyer et al (2008), having the right corporate culture will lead to a more planned and coordinated approach to implementing the CCS. Understanding and controlling the organization's risk appetite is a critical issue while implementing change. This knowledge will guarantee that the change level is appropriate for the internal and external risk environment and that the organization has taken steps to ensure a reasonable and acceptable change outcome (Iyer et al., 2008). This consideration would define an acceptable pace for the implementation of the CCS that is consistent with the expectations of all parties involved.

"The decision to go to the cloud is more complex than a simple cost gain," Venters and Whitley (2012) indicated for businesses. The cloud can also be utilized to enhance established web-services service models, according to the argument. Cloud computing is about more than just cost savings; it's about gaining a viable and long-term competitive advantage.

Venters and Whitley (2012) argued that cloud computing was not just a faster and less expensive means to drive innovation in small organizations, but that it also provided a new viewpoint on inventing utilizing 'Cloud Value Networks.' A marketplace for various cloud resources that are integrated

and sold to clients is referred to as a Cloud Value Network. This allows a 'Cloud Ecosystem,' defined by Weinhardt et al. (2009) as "the fruitful interplay and rivalry among all enterprises that implement distinct business models in the cloud computing setting." This allows firms to improve their competitive edge by innovating their business model and integrating apps such as business intelligence into their business operations and value network.

Small and medium-sized businesses are implementing or contemplating adopting the Cloud Computing (IDC Group, 2011). With a disruptive transformation in the information system on the horizon, SMEs must consider cloud computing services as a strategic option. It is vital to integrate business and IT priorities into the cloud deployment plan, according to the IDC Group (2011). The strategic goals and supporting IT strategies of SMEs must be effectively articulated and understood for any cloud plan to be built on a sound foundation (IDC Group, 2011). As a result, CCS investments should be made in tandem with SMEs' strategic plans to accomplish long-term financial objectives.

Chief Financial Officers (CFOs) have recognized the financial benefits of cloud computing as an appealing business strategy (Ford, 2010; Marston et al., 2010). Price commoditization has resulted from economies of scale obtained from centralized, shared computing resources, deemphasizing business requirements and resulting in disguised risks of other service limits to preserve price competitiveness (Durkee, 2010).

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Cloud-computing availability and dependability concerns were attributed by Russell, Yoon, and Forgionne (2010) to increased design and infrastructure complexity, as well as a plethora of possible Internet access failure points. To address these problems, performance modelling and service level agreements have been utilized (Russell et al., 2010). Other challenges with fragmented and distributed data-based assets have had an impact on cloud computing performance, leading to the development of novel data access strategies such as Map-Reduce, which allows for concurrent data retrieval, processing, and storage (Lin & Dyer, 2010).

Cloud computing allows businesses to save money. Computing costs can be significantly decreased, allowing funds to be diverted to more profitable endeavors. According to Kumar and Vidhyalakshmi (2012), the following are the primary areas of reduced computing expenses:

- a. **A Large Number of Services at Shared Costs:** Businesses can save money on capital expenditures while still having a variety of options for the services they require. There is no need to purchase expensive gear or software; instead, Cloud computing can be used to update or increase internal computing resources. Sharing installation, system maintenance, and other services costs with other Cloud customers is a wonderful way for your IT department to save money.
- b. **Improved Services at a Lower Cost:** Time and money are spent on in-house computing systems, hardware

and software maintenance, capacity concerns, security, and other everyday operations. All of these concerns may be addressed by a reputable Cloud provider, allowing you and your team to focus on productivity goals rather than being firefighters or technicians. In other words, you can get more done for less money. As a result, the customer may concentrate on his or her business rather than IT management.

- c. **Increased Organizational Agility:** Increasing capacity to meet the needs of a new project or meet the needs of a new department necessitates a significant upfront capital budget. Delays in budget approval, procurement, and the implementation of the new system can also lead to large losses. Additional computer resources can be accessible with Cloud technology by simply altering orders, and this can be done in less time and at a lower cost.
- d. **Elimination of Redundancy:** Adding more people, buying more equipment, and running redundant data processes can put a strain on a company's budget. They contribute to uncontrolled spending, which can stifle an organization's growth potential and negatively impact profitability.

Materials and Methods

The study was anchored on a positivist approach paradigm. Moreover, the study employed a descriptive and explanatory study design. It also applied the quantitative

approach of data collection and analysis. The study used a sample size of 416.

The stratified sampling technique was used to sample SMEs in Kampala. Data were collected through the survey questionnaire method and a self-administered questionnaire as the data collection instrument.

Inter-item consistency reliability (Sekaran & Bougie, 2013) and split-half reliability (Cronbach's alpha) was used to assess internal consistency.

To find Cronbach's Alpha coefficient, the study used Statistical Package for Social Sciences (SPSS) version 25 computer program to calculate the variables' reliability. Cronbach's Alpha Coefficient on each instrument had to be more than 0.70 in order for the instruments to be considered dependable. The instrument was deemed satisfactory (Vogt et al., 2013) since the Cronbach's Alpha values were all over 0.7, which is always the suggested number.

Pretesting was also used to demonstrate the instrument's clarity. Before the instruments were administered to the real sample, unclear instructions, incorrect numberings, and similar questions were rectified and adjusted.

The content, criteria, and construct validity of the instruments were tested to see how well they were representative, how they captured relationships between variables, and measured ideas. For all of the items in the questionnaire, the Content Validity Index was found to be 0.95. As a result, the questionnaire was deemed valid, as a CVI of at least 0.8 is regarded highly in terms of assessing validity.

Descriptive statistics were used for which frequency tables were processed in addition to the graphs. The means and standard deviations were also processed to establish the level and the extent of variation in the responses respectively.

Inferential statistics were also used for which Spearman rank correlation analysis was conducted at a bivariate level to establish the existence of relationships between environmental factors and decisions to adopt cloud computing in SMEs in Kampala. Moreover, more analyses were conducted in ordinal regression analysis models that were fitted organizational factors as measured on an ordinal Likert on the decision to adopt cloud computing by SMEs in Kampala.

Results and Discussion

The study sought to examine organizational factors that influenced a decision to adopt cloud computing by Small and Medium Enterprises in Kampala. Pursuant to this objective, the study sought to establish the respondents' decision in cloud computing adoption as a result of organizational factors in the SMEs. In order to achieve this objective, the respondents were prompted to do a self-rating on Human factors using 14 items. Each item was based on a Likert Scale ranging from 1-Strongly Disagree, 2-Disagree, 3-Neutral, 4-Agree to 5-Strongly Agree. Agreement on each item was computed using the item Means and Standard Deviations. The descriptive statistics therefrom are shown in Table 1 below:

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Table1: Descriptive Statistics of Organizational Factors

	N	Min.	Max.	Mean	Std. Deviation
The benefit of adopting cloud computing outweighs its cost	307	2	5	3.68	.773
Cloud computing services offered are relevant to the company's business or task coupled with risks to data	307	3	5	3.58	.649
The unreliability of in-sourced IT services drove us into cloud computing	307	2	5	3.74	.916
The need to have data backup necessitated the move to cloud computing	307	3	5	3.87	.696
It is easy to use cloud computing in our organization	307	1	4	2.71	1.107
Top management supports cloud computing adoption in our organization	307	2	4	3.29	.900
The human resource is well-trained to handle cloud computing (IT) services in our organization	307	1	4	2.88	1.322
Our customers expect our organization to use technology such as cloud computing	307	1	4	2.59	1.210
Because of market competition, cloud computing has become a must-have	307	1	4	2.62	1.026
The availability of cloud computing services has enabled us to implement it in our company.	307	1	4	3.38	1.026
Our capital expenditure or investment in new infrastructure has dropped as a result of cloud computing.	307	1	4	3.06	1.035
The cost of licensing new software is eliminated with cloud computing	307	1	5	3.56	1.120
Cloud computing eliminates or decreases the cost of upgrading the system and maintenance in our organization	307	1	5	3.65	1.188
Cloud computing decreases our IT costs (such as IT personnel)	307	1	5	3.75	1.170
Valid N (listwise)	307				

Among the organizational factors, the study showed that there was an agreement between respondents that the benefit of adopting cloud computing outstripped its cost (Mean = 3.68, St. Dev = .773). This implies that those who decided to adopt it

were informed by what it accomplished than what it cost.

Majority of the respondents also agreed on the item that cloud computing services offered were relevant to the company's business or task coupled by risks to data (Mean = 3.58, St. Dev = .649)

Data analysis also showed that the majority of the respondents agreed that the Unreliability of in-sourced IT services drove them into cloud computing (Mean = 3.74, St. Dev = .916) and they also agreed that the need to have data backup necessitated the move to cloud computing (Mean = 3.87, St. Dev = .696). This implies that securing organizational data and security backup was one of the main organizational factors that informed businesses in their decisions to adopt cloud computing.

Consequently, as already has been shown in similar items, the majority of the respondents disagreed that it was easy to use cloud computing in their organization (Mean = 2.71, St. Dev = 1.107). This can be attributed to many factors including the complexity and lack of sufficient information regarding cloud computing.

Another important finding in this study was the realization by the majority of respondents agreeing that top management supported cloud computing adoption in their organization (Mean = 3.29, St. Dev = .900). This, as shown above, can be attributed to the value attached to its use in businesses.

The study also revealed that there was disagreement by many respondents that the human resource was well-trained to handle cloud computing (IT) services in their organization (Mean = 2.88, St. Dev = 1.322). This can be attributed to earlier findings where many of the employees in the businesses were not familiar with the use of clouding and thus the human resource included. This could imply that almost all departments in an organization might be incompetent in the use of cloud computing.

Critical to this study was the finding where the majority of respondents disagreed that their customers expected their organization to use technology such as cloud computing (Mean = 2.59, St. Dev = 1.210). This implies that, essentially, customers did not really mind the nature of the technology used in an organization provided their services and products they want were delivered in the time and convenience when they wanted them.

The study also found that the majority of the respondents disagreed with the statement that “competition in the market has made the adoption of cloud computing mandatory” (Mean = 2.62, St. Dev = 1.026). This implies that it is an organization’s initiative to adopt any technology they want other than the adoption being a requirement by a specific industry.

The finding that the majority of the respondents agreed that the availability of cloud computing services had enabled them to adopt the same in their organization (Mean = 3.38, St. Dev = 1.026) implies that cloud computing adoption was made easy in businesses because of the convenience in the acquisition of the technology on market.

Data analysis also showed that the majority of the respondents agreed that cloud computing had decreased their capital expenditure or investment in new infrastructure (Mean = 3.06, St. Dev = 1.035). The majority also agreed that Cloud computing eliminated the cost of licensing new software (Mean = 3.56, St. Dev = 1.120) and that cloud computing eliminated or decreased the cost of upgrading the system and maintenance in their

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organization (Mean = 3.65, St. Dev = 1.188). In general, the study revealed that most of the respondents agreed that cloud computing decreased their IT costs (such as IT personnel). These findings imply that with the adoption of cloud computing in a business, organizational costs are reduced that may contribute to reduced IT budget costs.

The above is consistent with Kumar and Vidhyalakshmi's (2012) assessment regarding how cloud computing is cost effective for firms that adopt it:

- a. **A Large Number of Services at Shared Costs:** Businesses can save money on capital expenditures while still having a variety of options for the services they require. There is no need to purchase expensive gear or software; instead, Cloud computing can be used to update or increase internal computing resources. Sharing installation, system maintenance, and other services costs with other Cloud customers is a wonderful way for your IT department to save money.
- b. **Improved Services at a Lower Cost:** Time and money are spent on in-house computing systems, hardware and software maintenance, capacity concerns, security, and other everyday operations. All of these concerns may be addressed by a reputable Cloud provider, allowing you and your team to focus on productivity goals rather than being firefighters or technicians. In other words, you can get more done for less money. As a result, the customer may

concentrate on his or her business rather than IT management.

- c. **Increased Organizational Agility:** Increasing capacity to meet the needs of a new project or meet the needs of a new department necessitates a significant upfront capital budget. Delays in budget approval, procurement, and the implementation of the new system can also lead to large losses. Additional computer resources can be accessible with Cloud technology by simply altering orders, and this can be done in less time and at a lower cost.
- d. **Elimination of Redundancy:** Adding more people, buying more equipment, and running redundant data processes can put a strain on a company's budget. They contribute to uncontrolled spending, which can stifle an organization's growth potential and negatively impact profitability.

Recommendations

From the study, it is suggested that both executive and business managers evaluate the needs of their businesses and how the use of CC technology can positively influence the business before transitioning to a cloud solution. The study, therefore, recommends educating both top management and SME managers about emerging information technologies such as CC and its issues. This will help them to make the right decision to move to CC. The business management team should assist their staff, and provide them with the

required criteria to follow CC in carrying out their operations.

This study also forwards recommendations pertaining to who should move to the cloud and this is particularly the case for SMEs. In Ugandan SMEs, Cloud computing now makes eminent sense for small and medium-sized enterprises; although, there are major technological, operational, and organizational problems that need to be resolved before clouds are used widely at the enterprise level. Current cloud storage services are often not cost-effective for bigger businesses, particularly those that have obtained the best-of-breed efficiency gains from their computing operations.

Thus McKinsey Consulting (2009) observed that a high organization's 'typical' data center could run at considerably lower costs than would have been needed to outsource it to a cloud provider such as Amazon.com's EC2 (although this price can be substantially lowered by prepayment schemes and Linux systems).

Furthermore, McKinsey reports that while the cloud service will lower labor costs, the magnitude of the decrease is moderate (10–15 percent). Ultimately, the study recommends that businesses set their Service Level Agreement (SLA) uptime at 99.99 percent or higher so that their cloud computing operations are more effective and reliable.

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