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EFFECT OF USER PERCEPTION ON THE RELATIONSHIP BETWEEN TECHNOLOGY CONTEXT AND ADOPTION OF CLOUD COMPUTING: EVIDENCE FROM SMEs IN NAIROBI COUNTY, KENYA

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Abstract

Small and Medium Enterprises (SMEs) are the silent drivers of developing economy. However, SMEs continue to face a number of challenges as a result of stiff competition and rapid evolvement in the contemporary business market. Against this background, the study sought to investigate the mediating effect of user perception (perceived ease of use and perceived usefulness) on the relationship between technology context and cloud computing adoption in SMEs in Nairobi County, Kenya. The study utilized an explanatory research design using the Innovation Diffusion Theory blended with TAM model as theoretical basis. The study sample comprised 398 respondents. Regression results model showed technological context exhibited a positive significant effect on adoption of cloud computing (β1= 0.414, ρ<0.05). Similarly, Mediation effect of PEOU and PU respectively showed significant effect (β1= 0.0630, ρ<0.05); (β1= 0.0220, ρ<0.05) with a total indirect effect of (β1= 0.0851, ρ<0.05) and a Z-Value of PEOU 2.7782 and PU 1.4013. Evident from computed total ratio index, 11.92% of the total effect of technology context goes through the mediator. Therefore, this study recommends that

stakeholders in the SMEs field should strive to ensure that efforts to improve on cloud computing adoption are guided by the technological context and user perception.

Keywords: Technological Context, Cloud Computing Adoption, Perceived Ease of Use (PEOU), Perceived Usefulness (PU)

INTRODUCTION

Researchers argue that SMEs play a major role in poverty alleviation in developing countries and also stimulate domestic and regional economic growth in national and regional economies (Sogorb, 2005; Wagenvoort, 2003). They help to diversify economic activity and are flexible to changing market demands (Ongori, 2009). However, due to rapid evolvement in the contemporary business market, competition is stiff (Pauly, 2011). Leaving innovation as key for any business growth. Consequently, SMEs that wish to operate and survive in competitive markets have to resort to Information and Communication Technology (ICT) solutions which have the ability to enhance their competitiveness hence contribute towards efficiency and effectiveness for business sustainability. ICT empowers SMEs to compete with large firms (Swash,1998; Bayo-Moriones and Lera-Lopez, 2007).However, SMEs mainly use the traditional ICT solutions to stay competitive (Bayo-Moriones and Lera-Lopez, 2007). Traditional ICT leads to several challenges SMEs face, such as lack of capital, skilled staff and complex management.

SMEs must, therefore, be made more competitive, innovative to generate growth. Since SMEs play a role of increasing importance in the economy, especially when we consider their contribution to the generation of jobs as well as the social-economic growth of the public where they are located (Hartigan, 2005) it is then applicable that SMEs are stimulated into adopting new technologies and shaping competitive innovative products and services. Small Medium Enterprises have the right environment to prosper, from a skilled work force and drive economic growth. In particular, small and medium sized companies (SMEs) will be able to seize this opportunity in a wide variety of ways and small entrepreneurs have a critical role to play. It is noteworthy that inasmuch as SMEs play a vital role in the economy by nurturing competitiveness and employment, they are often faced with problems in attaining capital for the early start-up stages due to their small size (European Commission, 2005; Njama, 2013; Ebiringa, 2011) which may restrict their access to new technologies or innovations.

Cloud computing is a new paradigm shift in which including computing resource services, soft applications of distributed systems and data storage computing world is quickly

transforming toward a system of deriving relative applications for millions to extend as a service rather than to run on their personal computers (Ibrahim and Musah, 2015). Computing is a massively scalable IT-related capabilities provided as a service to external customers using internet technologies (Gartner, 2009)

Erdogmus (2009) considers cloud computing a pool of highly scalable abstracted infrastructure capable of hosting end-customer applications that are billed by consumption. IT capabilities are referred to as real time over the Internet services provisioned, delivered, and consumed on request (Sultan, 2010). Besides, cloud computing is an enclosed business model about new technologies, such as virtualization, applications (Software as a Service (SaaS), platform (Platform as a Service (PaaS), and hardware (Infrastructure as a Service (IaaS) (Goscinski and Brock, 2010)

To realize business agility to enhance competitiveness, SMEs need to streamline output to reasonable costs, improve on process innovation and assimilate new technologies. IT departments are persistently under pressure to offer new solutions that are considered more flexible, efficient and cost-effective, enabling even faster time to market. A flexible IT infrastructure can remove some of the barriers to global competition and allow smaller businesses to be efficient, allowing them to have a competitive edge hence providing a degree of flexibility. Cloud computing has the potential to play a major role in addressing inefficiencies and make a dynamic contribution to the growth and competitiveness of SMEs which are the pillar for economic growth and job creation (Mutula and Brakel, 2006). By adopting cloud computing service models, SMEs will be able to avoid large up-front costs on IT resources for their production needs and business model of innovation (Chatman, 2010; Kuo, 2011; Japan-NE. 2012; Lisa, 2011)

ADOPTION OF CLOUD COMPUTING

While cognizant of the fact that the determinants of cloud computing adoption are distinguished into three setting groups: technological, organizational, and environmental (Tornatzky and Fleischer 1990) as classified under the TOE framework (Chong and Ooi, 2008; Zhu, Kraemer, Xu, Dedrick, 2004) this paper focuses on the technological context. For the purposes of this discussion, technological setting alludes to inner and outside innovations appropriate to the firm (Rui, 2007; Oliveira and Martins, 2011). In addition, we adopt Baker's (2011) view that technological setting speaks to the inner and outer advancements identified within the firm; both advances that are as of now being used at the firm and in addition those that are accessible in the market yet not at present being used. These advancements may incorporate either equipment or practice.

Technology context consists of three properties - relative advantage, compatibility and complexity. Rogers (2003) defines relative advantage as the degree to which an innovation is perceived as being better than the idea it superseded (other computing paradigms). Cloud computing has both technical and economic advantages over traditional IT environments. Rogers (1983) characterizes relative favourable position as how much a technological variable is seen as giving more noteworthy advantage to firms. To and Ngai (2006) note that it is sensible that organizations mull over the points of interest that originate from adopting innovations. Cloud computing services, which permit operations to be summed up and prepared through web exchanges, can substitute for or supplement ERP computer programs.

The normal advantages of inserted cloud computing services incorporate the accompanying: speed of business correspondences, productive coordination among firms, better client interchanges, and access to market data preparation (Armbrust *et al.,* 2010) Cloud computing has advantage over different innovations, for example, decreased cost, versatility, portability and shared assets. Feuerlicht and Govardhan (2010) note that cloud computing offers leased services on pay-as-you-utilize premise which prompt to changing the level of utilization as necessitated by the needs of a firm. The likelihood of reception will increase when organizations see a relative preferred standpoint in an innovation (Thong *et al.,* 1994). In this way, Sokolov (2009) comments that relative focal points of cloud computing are shown even from ICT capability-ties viewpoint. In any case, Buyya *et al.* (2009) point out that firms might not have trust in a cloud computing framework since it is generally new to them. It might require clients a long investment to comprehend and execute the new framework. Subsequently, many-sided quality of an innovation can go about as a hindrance to usage of new innovation; unpredictability component is typically adversely influenced (Premkumar *et al.,* 1994). Rogers (2003) notes that compatibility alludes to how much innovation fits with the potential adopter's current qualities, past practices and current needs. Compatibility has been viewed as a fundamental component for adoption of innovation (Wang *et al.,* 2010). At the point when innovation is perceived as good with work application frameworks, firms are generally prone to consider the adoption of new innovation. At the point when innovation is seen as fundamentally contrary, significant modification in procedures that include impressive learning are required as the firms are most unlikely to adopt the technology. For SMEs, it is essential that the new innovation is consistent with their existing values and needs, since poor integration of new systems with existing ones could result in the opposite situation (Akbulut, 2003; Chau, 2001; Hardgrave and Riemenschneider, 2003) Complexity is the degree to which an innovation is perceived as relatively difficult to understand and use Rogers, (2003). Parisot (1995) and Sahin (2006) have espoused that new technologies have to be user-friendly and easy to use in order

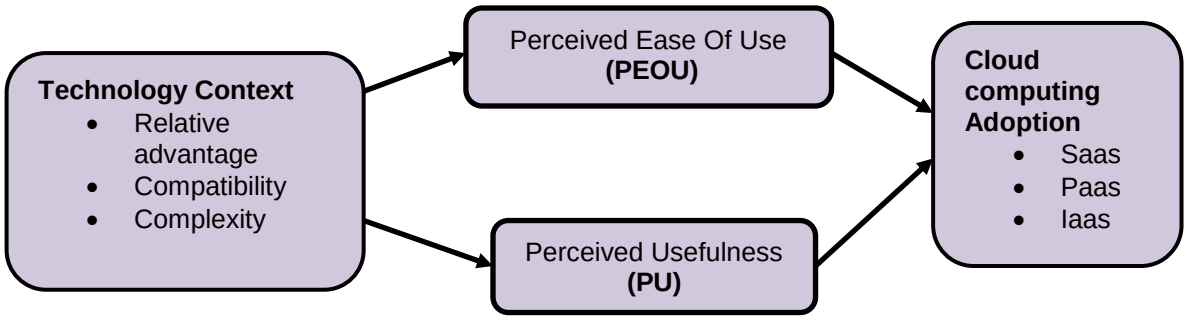
to increase the adoption rate. At the point when SMEs are faced with difficulties regarding changing the procedures in which they cooperate with their business frameworks, then they are no doubt not to receive new innovation. Jain and Bhardwaj (2010). note that portability offers clients the facility of getting to and working away at their records from anyplace on the planet; if they have access to a personal and a web connection. Jain and Bhardwaj (ibid) note that shared assets is another preferred standpoint to the organizations offered by cloud computing which empowers their workers. SMEs are most likely to adopt a technology if they perceive the technology compatible with their existing work, not complex to use and has a relative advantage.

However, studies on effect of technological context on cloud computing adoption are inconclusive. While some studies have found technology context useful in understanding critical factors of IT adoption in a given organisation (Tornatzky and Fleischer 1990) results have been varying depending on different scholars and environment (To and Ngai, 2006 ;Wang *et al.,* 2010;Tan *et al.,* 2008) Moreover, insignificant results on the effect of complexity and compatibility on cloud adoption was inconsistent with previous studies (Wang *et al.,* 2010; Oliveira and Martins 2010) but consistent results with those of Lin and Lin (2008). In addition, while cloud computing has been discussed as a new technology development that can provide several advantages both strategic and operational to its adopters, the adoption rate is slower than anticipated (Goscinski and Brock, 2010). For instance, in Kenya, despite the government efforts at increasing the competitiveness of SMEs through ICT by enhancing internet infrastructure and accessibility, the adoption of cloud computing among SMEs has not been satisfactory (Makena, 2013). Kituku (2012) has also observed that cloud computing is still new to both academia and commerce in Kenya. Despite the great advantage of cloud computing, many research discoveries are in the developed countries (Osterman, 2012) and very few in the developing countries. As a result, the authors of this paper deemed it necessary to carry out a study that sought to address the research gap by analyzing the mediated effect of user perception on the relationship between technology context and cloud computing adoption.

PU defines prospective user's subjective probability that using a specific application improves operations(Lu *et al.,* 2010; Liu and Yao, 2003) It provides diagnostic lenses into how actual use and intention to use are influenced. PEOU measures the prospective user's assessment of the mental efforts required of the use of the target applications. Mental effortlessness demands by an IT attracts more adoption behaviour; thus, innovations with perceived complexities of user interface and steep learning curve are thought risky to adopt (Opia, 2008) PEOU is a distinct but related construct to PU. Studies undertaken by scholars to assess observed usefulness and ease of use trade-off and to determine the impacts of external

variables on these two mental determinants show mixed findings (Chau and Hu 2001). Nevertheless, empirical findings confirm the positive relationships between ease of use and attitude towards use (Venkatesh and Davis 2000) and show that PEOU is a proven key determinant of users' intention to accept IT (Venkatesh and Davis 2000). Figure 1 below is a representation of how the technology context affects cloud computing adoption mediated by user perception (Perceived ease of use and perceived usefulness).

Figure 1: Mediating effect of Perceived Ease of Use and Perceived Usefulness of Technological Context on Adoption of Cloud Computing



THEORIES AND MODELS UNDERPINNING THE STUDY

This paper is grounded on the Innovation Diffusion Theory (IDT) as developed by Rogers (2003). Diffusion is the procedure by which a development is embraced by individuals from a specific group. It is noteworthy that diffusion is not a solitary, general hypothesis, yet rather a few hypothetical points of view that identify with the general idea of diffusion, that is, it is a meta-hypothesis. The IDT hypothesis contends that potential clients settle on choices to receive or dismiss an innovation in view of convictions that they shape about the innovation (Agarwal et al., 2000). Technology Acceptance Model is the foremost traditional adoption theory in the field of IT (Awa, Eze, Urieto and Inyang, 2011) and provides a basis for unveiling the impacts of external variables on adoption decisions with its basic postulates resting firmly on economic, utilitarian, and attitudinal grounds. TAM proposes PU and PEOU as the fundamental determinants of IT adoption. An individual's intention to use an application is explained and predicted by his perception of the technology's usefulness and its simplicity.

The strengths of Rogers (2003) diffusion of innovation and Ajzen (1991) Theory of Planned Behaviour (TPB) have been explored to enrich TAM by adding usage and placing premiums on specific settings and external variables that influence a technology's adoption process. TAM and TPB are routed to the Theory of Reasoned Action (TRA). Though TAM and TPB neglected the influences of psychological, social, and interpersonal variables on IT

adoption decision (Ukoha, Awa, Nwuche and Asiegbu, 2011), TPB complemented TAM's constructs with subjective norms and perceived behavioral control to explain perceptions of ease or difficulty of performing an act given resource constraints. Taylor and Todd (1995) believe that TPB explanatory and predictive utilities are better enhanced by extending and integrating with TAM. Other researchers (Venkatesh and Davis, 2000) validated, modified, extended, and improved TAM under different situations to make for wider applicability in the novel knowledge economy.

Diffusion hypothesis gives a structure that comprehends why ICT is received by a few people and not by others. This hypothesis can clarify, anticipate, and represent elements that expand or obstruct the dispersion of innovations. Among SMEs, business visionaries and managers constitute the adopters who at their own particular volition and relying upon the apparent expenses and benefits decide to adopt information and communication technology.

RESEARCH METHODOLOGY

The study employed a positivism approach and utilized an explanatory research design and cross-sectional survey. The study comprised of 398 respondents drawn through a random sample technique, from Nairobi County, Kenya. Data that was collected from IT managers, managers or entrepreneurs and analyzed using multiple regression model. Regression was used to test the degree to which the independent variables predict the dependent variable. The Independent variable technology context. The measurement tool of relative preferred standpoint is embraced from Premkumar and Ramamurthy (2010) and Jain and Bhardwaj (2010) Complexity tool was adapted from Premkumar and Ramamurthy (1994) Gardner and Amoroso (2004). Compatibility tool was adapted from Wang *et al.* (2010). User perception is the mediating variable adapted from Schillewaert *et al. (2005).* while the dependent variable was adoption of cloud computing. Further, to accomplish construct validity, convergent and discriminant validity were set up. Information gathered on demographic variables was handled and detailed in percentage through descriptive analysis.

RESULTS AND DISCUSSION

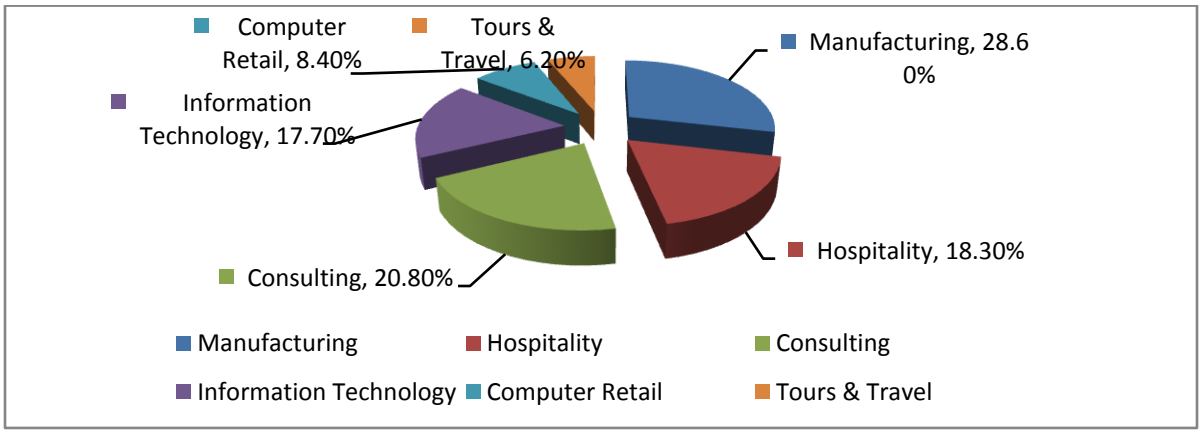
Firm Characteristics

The study deemed it important to establish the firm characteristics. Based on the findings, the targeted firms had a minimum of 10 employees and a maximum of 300. On average, there were 73 employees. On average, the firms had been in existence for the past 16 years. Generally, the firms had applied ICT for the past 9 years. Besides, the entrepreneurs had a tenure of 5 years.

Category of the Firms in the Sector

The study also considered the category of the firms in the sector. The firms were in the manufacturing (28.6%), consulting (20.8%), hospitality (18.3%), information technology (17.7%), computer retail (8.4%) and tour and travel (6.2%) sector. The results are indicated in Figure 2.

Figure 2: Category of the Firms in the Sector by industry type



Technology Context

In terms of the relative advantage of cloud computing, the respondents noted that the use of cloud computing at work is advantageous (M=4.54, SD=0.606).This means that cloud computing made the SMEs' processes more efficient. In so doing, it enhanced SMEs' productivity and performance and eventually led to profitability. As well, with cloud computing, the respondents only paid for what they used (M=4.1, SD= 0.87).This conforms to the assertion by Feuerlicht and Govardhan (2010) elucidating that cloud computing offers rented services on a pay-as-you-use basis which leads to adjusting the level of usage according to the current needs of the organization. They were also able to scale up their requirement when required (M=4.16, SD=0.795). Cloud computing therefore provides a wide array of benefits to SMEs with robust coordination features such that they can only pay for what they use and are able to scale up their requirements whenever needed. Consistently, Marston *et al*. (2011) echo that with cloud computing, SMEs have almost instant access to hardware resources and a faster time to market with no upfront capital investment. In addition, the respondents could access information any time from any place (M=4.29, SD=0.84). Most importantly, performance did not decrease with growing user base (M=3.83, SD=0.961).There is thus better customer care and access to information reliably. Besides, the respondents could access and share resources placed on cloud (M=4.17, SD=0.748).Individuals could access resources placed on cloud from any location hence saving on time and money. In tally with the above, Miller (2008) infers that

cloud computing can offer many advantages related to capacity, reliability, and flexibility. On the whole, the results on relative advantage summed up to a mean of 4.0541, standard deviation of 0.52369, skewness -1.519 and kurtosis 5.535. From the foregoing, the relative advantage of cloud computing are self-evident.

Regarding compatibility, cloud computing was compatible with existing technological architecture of their company (M=3.89, SD=0.835).The high compatibility of cloud computing with the technological architecture of the SMEs positively affected the adoption process. However, whenever there were incompatibility issues with cloud computing, there was use of integrated services (M=3.95, SD=1.093). This means that SMEs have a backup in case of incompatibility issues. Additionally, the use of cloud computing at work was consistent with existing practices in their company (M=3.82, SD=0.912). Customization was also easy in cloud-based services (M=3.87, SD=0.916).It was also easy to import and export applications/data from cloud services (M=3.85, SD=1.021). Further, the use of cloud computing at work was compatible with their firm's existing format, interface, and other structural data (M=3.75, SD=0.998).This infers that the technical and procedural requirements of cloud computing are consistent with values and the technological requirements of the SMEs. However, in case of, non-customizable cloud-based services, the respondents incur retraining cost (M=3.54, SD=1.053). Lastly, the respondents inferred that cloud computing is compatible with all aspects of their work (M=4.03, SD=0.868).The results on the compatibility of cloud computing summed up to a mean of 3.8381, standard deviation of 0.57663, Skewness 0.051 and kurtosis -0.624. Compatibility is therefore one of the significant aspects affecting the adoption of cloud computing among the selected SMEs in Nairobi County.

As far as complexity was concerned, through personal interaction with cloud computing, the respondents perceived it to be useful when it is easy to use (M=4.22, SD=0.797). Besides, the respondents found cloud computing flexible to interact with (M=4.09, SD=0.919). Moreover, performing many tasks together did not take up too much of their time (M=3.7, SD=0.922). Additionally, the respondents found it easy to integrate their existing work with the cloud based services (M=3.68, SD=1.125). Adoption was therefore perceived to be high since the respondents perceived the use of cloud computing to be useful, flexible to interact with and time saving. In conformity, prior scholars (Parisot, 1995; Sahin, 2006) have espoused that new technologies have to be user-friendly and easy to use in order to increase the adoption rate To sum up, the use of cloud computing did not expose the respondents to the vulnerability of computer breakdowns and loss of data (M=3.45, SD=1.495). As such, the respondents were not prone to security and privacy issues. The results on the complexity of cloud computing summed up to a mean of 3.8298, standard deviation of 0.7131, skewness -0.376 and Kurtosis of 0.048

User Perception - Perceived Ease of Use and Perceived Usefulness

User perception consists of the following sub-constructs; perceived ease of use and perceived usefulness. The results on perceived ease of use of cloud computing summed up to a mean of 3.96, standard deviation of 0.657, Skewness -0.281 and kurtosis -0.136.The skewness and kurtosis values range from -1.96 to +1.96 indicated a normal distribution of the responses in perceived ease of use. Regarding perceived ease of use of cloud computing, the procedure is understandable, easy to learn, and make use of. Further, the use of cloud computing is adoptable if perceived to be easy to use. Additionally, Respondents, agreed that cloud computing is an easy technology for one to become skilled and its flexible to interact with.

As far as perceived usefulness was concerned, entrepreneurs ascertained that cloud computing enables them to manage their business operation in an efficient way. The results on perceived usefulness of cloud computing summed up to a mean of 4.1589 indicating that the respondents were agreeable. The standard deviation was 0.673, Skewness -0.596 and the kurtosis 0.115. As such, it has increased their business productivity and the quality of business operation and has advanced their competitiveness. Furthermore, cloud computing has enabled the entrepreneurs to accomplish organizational tasks more quickly and on the whole, cloud computing is perceived useful to the organization. It is evident in Table 1 below.

Table: 1 Perceived Ease of use and Perceived usefulness

Item: Perceived Ease of Use	**M**	**SD**	**Skewness**	**Kurtosis**
The procedure is understandable.	4.02	0.799	-0.6	-0.8
Is easy to learn..	4.02	0.71	-0.8	0.91
Is easy to make use of.	4.03	0.889	-0.9	1.03
Is adoptable and easy to use	4.03	0.833	-0.3	-1.3
It is an easy technology for one to become skillful	3.8	1.164	0.49	-0.9
Is flexible to interact with.	3.88	1.003	-0.8	1.32
Composite Mean	**3.9643**	**0.65687**	**-0.281**	**-0.136**

Item : Perceived Usefulness	**M**	**SD**	**Skewness**	**Kurtosis**
Enables me to manage business operation in an efficient way.	4.26	0.766	-0.9	-1.2
enables increase of business productivity	4.19	0.968	0	-1.6
Enables one to accomplish organizational task more quickly.	4.19	0.778	-0.3	-0.9
improves the quality of business operation	4.12	0.892	0.69	-1.4
advances my competitiveness	4.18	0.841	-0.5	-0.5
when perceived useful to the organization	4	1.078	-0.1	-0.5
Composite Mean	**4.1589**	**0.6734**	**-0.596**	**0.115**

Adoption of Cloud Computing

Software as a Service-computing model allows users to access simple desktop applications such as word processing and spreadsheets as a service on the web. From the findings of this study, SMEs used I-cloud computing to a high extent in their businesses. On the other hand, the standard deviation of 1.085 revealed a high degree of variation in the responses. The study indicated that the respondents applied email services in their business. Further, there was an indication that the email application was accessible from anywhere anytime. This meant that the entrepreneurs could conveniently and effectively interact with their customers. From the foregoing, it was concluded that CRM users could access applications on demand and CRM services were effective. The study indicated a composite mean of 3.696, standard deviation of 0.7314, Skewness -0.768 and Kurtosis 0.397. This implied that most of the respondents were agreeable and besides, standard deviation was indicative of fewer variations in the responses.

In the Platform as a Service approach, cloud providers give the consumer a higher level of abstraction to deploy onto the cloud infrastructure consumer created or acquired applications created using programming languages, operating system, web server, libraries, services, and programming language tools (Mell and Grance, 2011). As such, the study deemed it important to establish the extent of use of the features of Platform as a Service in the selected SMEs. In regards to the extent of utilization of cloud data storage service, the results implied that the SMEs utilized cloud data storage services. Respondents indicated cloud data storage service as effective. Further, the respondents were also asked to rate the extent to which their firms enjoyed server and network service maintenance offered by their service providers. The results showed a significant number of the SMEs were enjoying server and network service maintenance. Besides, the standard deviation indicated less variation in the responses.

The respondents were also asked to rate the amount of data they stored in the I-cloud. Generally, the results items on Platform as a Service realized a composite mean of 3.58, standard deviation of 0.79549, Skewness -0.697 and Kurtosis 0.384. This implied that most of the respondents were agreeable and there was less variation in the responses. Additionally, the skewness and kurtosis values -1.96 to +1.96, indicated a normal distribution of the responses.

The basic strategy of IaaS is to set up a fixable environment where consumers are allowed to perform several activities on the server , for instance , starting and stopping it , customizing it by installing software packages , attaching virtual disks to it , and configuring access permissions and firewall rules . The respondents indicated cloud infrastructure was reliable implying that it can be used by SMEs to meet their goals. In regards to server upgrades, study results inferred that the respondents enjoyed server upgrades. The standard deviation indicated less variation in the responses. In response to the extent to which they felt

infrastructure was the responsibility of the cloud service provider, inferred that SMEs do not have to worry much as the infrastructure is owned by the service provider. The results items on Infrastructure as a Service realized a composite mean of 3.64 standard deviation of 0.806, Skewness 1.958 and Kurtosis 2.409

Factor Analysis for Study Variables

The researchers ran a principal component analysis to identify patterns in data, and to express the data in such a way as to highlight their similarities and differences. Besides having data set items reduced to manageable level while retaining as much of the original information, it helped in identifying groups or clusters of variables. By use of varimax rotation, the researcher retained all factors with Eigen values greater than 1. The criterion was based on the idea that the Eigen values represent the amount of variation explained by a factor and that the Eigen value of 1 represents a substantial amount of variation. Sampling adequacy was tested using the Kaiser-Meyer-Olkin Measure (KMO measure). As evidenced in Table 2, KMO was greater than 0.5.

Table 2: Factor Analysis

Total Variance Explained						
	Total	% of Variance	Cumulative %	KMO	Bartlett's Test Chi-Square	Sig.
Relative advantage	1.997	28.54	28.54	0.662	518.8	0
	1.845	26.36	54.89			
	1.139	16.27	71.17			
Compatibility	2.539	31.74	30.36	0.693	669.6	0
	1.923	24.03	55.77			
Complexity	2.111	42.22	42.22	0.635	342.3	
	1.308	26.16	68.38			
Perceived Ease Of Use	2.303	38.38	42.22	0.635	689.4	0
	1.831	30.52	68.90	0.775		
Perceived Usefulness	2.594	43.23	43.23	0.787	1005.6	
	2.052	34.19	77.42			
SaaS	2.958	49.31	49.31	0.798	968.9	0
	1.443	24.04	73.35			
PaaS	2.058	51.46	51.46	0.813	605.8	0
	1.301	32.52	83.98			
IaaS	1.795	44.87	44.87	0.461	242.3	0
	1.055	26.38	71.24			

Regression Analysis

The study predicted that perceived ease of use and perceived user perception does not mediate the relationship between technology context and cloud computing adoption. In order to test the hypothesis, regression models were run as indicated in Table 3. The explanation of the models are as follows; Model 1 is the regression of mediating variable; (PEOU and PU) on technology context, model 2 is the regression of the criterion variable; level of adoption of cloud computing on both technology context (predictor variable), perceived ease of use and perceived usefulness (mediator) respectively, when both are included as simultaneous predictors of Y. From the findings in PATH 1 denoted as (a) technology context accounts for a significant proportion of variance in the mediating variable PEOU (β=0.3917, $p<0.01$) and PU (β= (0.3071 $p<0.01$) In path 2 denoted as (c') and (b) it was revealed that technology context and user perception (PEOU and PU) respectively accounts for a significant proportion of variance in adoption of cloud computing (β=0.6284, $p<0.01$); (β=0.1609, $p<0.01$) (β=-0.0718, $p>0.01$).The correlation of technology context (IV) to PEOU and PU (MV) is denoted as path a (0.3917); (0.3071) respectively. The correlation of PEOU and PU (MV) to cloud computing adoption (DV) is denoted as path b (0.1609); (0.0718) respectively. To establish the mediation effect and it's significant there was need to get a product of (a) and (b) (Mackinnon, 2000). Path a(0.1609)* b(0.3917) = (0.06302) for PEOU and Path a(0. 3071) * b(0.0718)= (0.02205) for PU. However perceived usefulness (PU) and (PEOU) effect on level of adoption showed positive beta coefficients and significant p-value.

Furthermore, to test significance of mediation effect, Normal theory tests (sobel) for indirect effect was generated using PROCESS macro. The Z-value of PEOU 2.7782 yielded a p-value of 0.0055 and the Z-value of PU 1.4013 yielded a p-value of 0.1611**.** Due to the low p-value associated with Z-value for PEOU and PU it can further be concluded that a significant mediation occurred. It was further noted that the association between technology context (IV) and cloud computing adoption (DV) significantly increased due to the inclusion of the mediating variables PEOU and PU. The direct effect c' (0.6284) is the size of the correlation between technology context (IV) on cloud computing adoption (DV) inclusive of PEOU and PU (MV) in the regression. The total effect c (0.7134) is the total sum of Indirect effect a*b (0.0851) added to direct effect c' (0.6284).

Therefore, a partial mediation is evident with an increasing effect, hence a complimentary relationship. The total ratio index was computed by dividing the indirect effect (0.0851) by the total effect (.7134) giving a total percent of 11.92%. This implies that 11.92% of the total effect of technology context on adoption of cloud computing goes through the mediating variable; perceived ease of use and perceived usefulness and about 88.08% of the

total effect is either direct or mediated by other variables not included in the model. Additionally, it is evident that the 95% confidence interval conclusively shows that significant mediation has occurred. The confidence interval for a*b does not include zero hence a clear indication of mediation. Confidence interval of the lower limit is .0392 and upper limit is .1090 as shown below in Table 4.

Basing on the explanation above, it is conclusive enough to state that PEOU and PU combined has an effect on the the relationship between technology context and adoption of cloud computing among SMEs in Nairobi Kenya as shown in Figure 3.

Table 3: Regression Coefficients of the Different Paths for Technology Context

	PATH 1 (a); PEOU; PU	**T**	**PATH 2(b;c'); LoA**	**T**
	B(S.E)		**B (S.E)**	
(Constant)	2.4741 (0.2815)*	8.7885	.3111 (0.2460)*	1.2650
	2.9907 (.2939)*	10.1763		
Technology Context	0.3917 (0.0734)*	5.3349	0.6284 (0.0572)*	10.9813
	0.3071 (0.0766)*	4.0065		
PEOU			0.1609 (0.0486)*	3.3109
PU			0.0718 (0.0466)	1.5417
R	*0.2858 ; 0.4730*		*0.6172;*	
R Square	*0.2186 ; 0.0478*		*0.3809*	
F	*28.461 ; 16.052*		*65.227*	
Sig.	*.000*		*.000*	

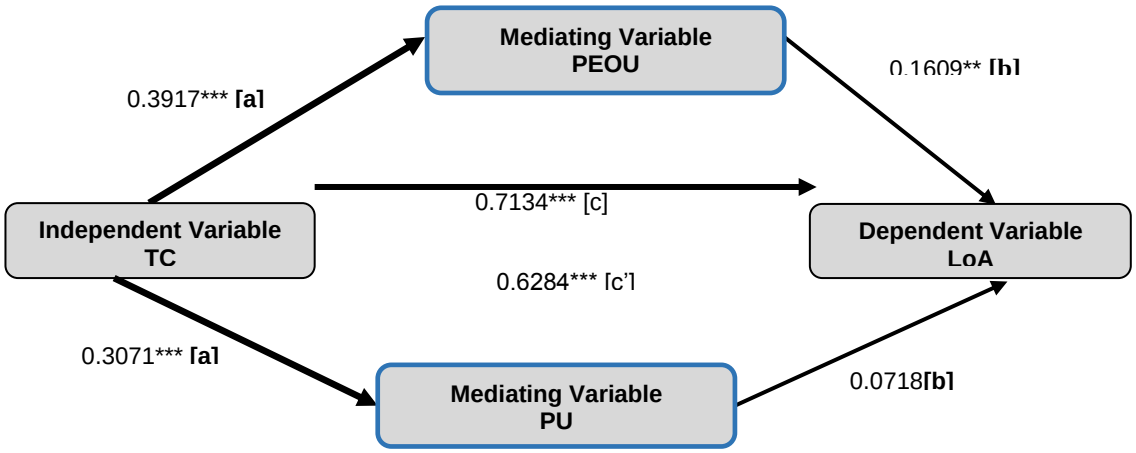
Table 4: Results for Mediation Effect of Perceived Ease of Use and Perceived Usefulness on the Relationship between Technology Context and Adoption of Cloud Computing

Significance of Mediation		**Significance**
Z-value PEOU	2.7782	*p* = 0.0055
Z-value PU	1.4013	**=** 0.1611
95% Symmetrical Confidence Interval		
Lower	0.0392	
Upper	0.1090	
standardized indirect effect		
a*b	0.0687	
Se	0.0174	

Table 4...

Effect size Measures	
	Standardized Coefficients
Total:	0.7134
Direct:	0.6284
Indirect:	0.0851
Indirect to Total Ratio:	0.1192

Figure 3: Mediation Graph Predicting the Mediation Effect of Perceived Ease of Use and Perceived Usefulness on the Relationship between Technology Context and Adoption of Cloud Computing



CONCLUSION AND RECOMMENDATIONS

Based on the above observations, the findings validate the conceptual framework developed. This paper has shed light on the link between technology context, user perception and adoption of cloud computing among SMEs. A partial mediation is evident with an increasing effect, hence a complimentary relationship. The findings, of this study have shown that perceived usefulness and perceived ease of use have a strong correlation to user acceptance of information technology. In addition, a system perceived to be easier to use, compatible and with a relative advantage will facilitate more system use and is more likely to be accepted by users. The main implication to industry, service providers will be able to create effective public awareness and enhance insight for training and support. Socially, due to scalable pay-as-you-go cost structure, reducing IT investment will enable reliable service accessible from anywhere anytime enhancing quality and lower cost services to customers.

The limitation of this study is largely related to the methodologies used. The limitations of this research is restricted to only those SME's who have adopted cloud computing to deliver the core product or service of their business hence the data collected is only relevant to this part of the total population. This study, emphasized more of quantitative approach rather than qualitative.

On a geographical dimension, this study was primarily limited to SMEs in Nairobi. The justification of selecting Nairobi is due to its diversity of Industries compared to other areas in Kenya. Therefore, it may not be appropriate to generalize to the whole population of the SMEs in this country or any other country but only to the population from which that sample was taken. Therefore, future studies could implement the study in terms of a longitudinal rather than a cross-sectional design. The longitudinal study would need to correct changes in data relative to the time element. Despite possible limitations of using single-period data, the results of the present study provide valuable insights on the effect of user perception on the relationship between technology context and adoption of cloud computing.

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