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The Role of Organizing Vision in Cloud Computing Adoption by Organizations in Kenya

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Abstract Cloud computing as an emerging IT innovation has attracted a growing number of studies in recent years. Key amongst these studies is the adoption of cloud computing. Most studies investigating cloud computing adoption have proceeded along the contours of rationalistic perspectives. While significant progress has been achieved in enhancing the understanding of cloud computing adoption through the rationalistic lenses, this study, steps out to adopt an organizing vision perspective. Given that cloud computing adoption has been steadily increasing in Kenya, the current study aims at investigating the determinants of cloud computing adoption from an organizing vision perspective. The relationships amongst interpretation, legitimation and mobilization as functions of the organizing vision and cloud computing adoption was conceptualized through a priori research model. The research model was tested using structural equation modelling (PLS SEM). A firm level cross sectional survey was conducted on a sample of 93 firms in the financial, manufacturing and the ICT sectors. A section of the results indicates that there is no significant relationship between the organizing vision functions and cloud computing adoption. The results further indicate that there is a significant relationship between interpretation and legitimation; and legitimation and mobilization. A major implication of this study is that adequate interpretation of cloud computing plays a role in its legitimation as an innovation of value. The study also underscores the important role that needs to be played by professional bodies, industry organizations, standards bodies and the government in the development of an organizing vision for emerging technologies.

Keywords: *cloud computing, cloud computing adoption, organizing vision, interpretation, legitimation, mobilization and innovation concept*

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1. Introduction

Cloud computing is an Information Technology (IT) innovation that presents a new and novel way of delivering IT services to individuals and organizations. Cloud computing as an IT innovation is forcing firms to rethink how IT services are procured, managed and deployed. Cloud computing allows users to temporarily utilize computing infrastructure over the network, supplied as a service by a cloud provider at possibly one or more levels of abstraction [1]. While the traditional captive IT services forced organizations to incur huge amounts of capital expenditures and operating costs for the IT department, cloud computing obviates the requirements for huge capital and the services are on-demand and metered [2]. Cloud computing has attracted the attention of organizations due to its many benefits. Such benefits include; minimal upfront capital costs and rapid elasticity [2], high speed of deployment and access to quality software [3]. Generally, cloud computing eliminates the high upfront and maintenance costs associated with the captive on premise IT infrastructure installation and avails economies of large scale that accompany pooling of resources. On the other hand, organizations still have concerns regarding security and privacy of their data [4], reliability and availability of cloud services [4], vendor management [5] and regulatory ambiguity [6]. Further, organizations consider corporate culture and change management as the second greatest challenge after security [2].

Despite the concerns, cloud computing adoption by organizations is on the rise. Recent market research reports indicates a major shift from in-house IT infrastructure spending to cloud computing spending [2]. An international study on key information technology and management issues ranked cloud computing 2nd, 3rd and 2nd in terms of top application and technology developments in 2011, 2012 and 2013 respectively [7,8,9], further suggesting that organizations are gradually recognizing the strategic value of cloud computing. A recent study [10] predicts that by the year 2020, more than $1 trillion in IT expenditure will be directly or indirectly toward migration to cloud computing systems. As such, a fierce competition is expected among major cloud service providers such as Amazon, Microsoft, Salesforce, and Google for a share in the cloud's expanding market.

The growing importance of cloud computing in business has not only attracted business entities and investors but also researchers and practitioners. A variety of cloud computing aspects are well attended to in extant literature. For example; the benefits of cloud computing [11], models of cloud computing [12], technical issues regarding software, hardware, provision and pricing [13]. Other scholars have addressed cloud computing adoption by organizations [14,15,16,17,18]. Studies on IT innovations adoption have generally converged on the economic-rationalistic models [19], alias dominant paradigm [20]. Under the economic-rationalistic models, organizational IT adoptions are determined by organizational, technological and environmental factors [19]. The main theories in the dominant paradigm are; diffusion of innovation theory (DOI) [21], the technology acceptance model (TAM) [22], the technology organization environment (TOE) [23]. The key characteristic of these theoretical frameworks is that they operate predominantly within the organizational boundaries.

In order to step out of the organizational boundaries in IT innovation research, Fichman [[20], p. 315] and P. Wang [[19], p. 4] proposed the socio-cognitive approach as a possible avenue. The social-cognitive perspective argues that the adoption and diffusion of IT innovation among organizations is socially constructed by the technology discourse, as well as shared norms, values and beliefs about the innovation [18]. The main socio-cognitive theories include; institutional theory [24], power and trust [25]; management fashion [26] innovation concept [19] and organizing vision [27,28]. This study employed the organizing vision as a theoretical prism in understanding how socio-cognitive factors influence adoption of IT innovations in general and cloud computing in particular.

1.1. Cloud Computing

The history of Grids and the Cloud may be traced back to 1961 MIT centennial, when John McCarthy first exposed the idea of 'Utility Computing' and he predicted that it would become the basis of a new and important industry [29]. The integration of various innovations gave birth to cloud computing. These innovations included grid computing, utility computing and virtualization of computer hardware resources, especially storage and computation power. The term cloud computing has been defined as the provision of IT solutions as a service rather than as a product through the internet [30]. Cloud computing services are delivered in terms of three models. The models are; cloud service models, cloud deployment models and the cloud consumption model.

Cloud computing service models are mainly referred to as cloud service layers. These layers have been variously referred to as cloud service models [31], cloud business models (Yang & Hsu, 2011; Zhang, Cheng, & Boutaba, 2010) and cloud architectural layer [33]. The earliest classification known as the SPI model [34] stratified cloud services into software as a service (SaaS), platform as a service (PaaS) and infrastructure as a service (IaaS) (Yang & Hsu, 2011; Zhang et al., 2010). The SaaS layer provides applications that run on the cloud eliminating the need to install and run the applications on the client computer [35]. SaaS is a software that is owned, delivered and managed remotely by one or more providers and offered on a pay-per-use mode [33]. PaaS facilitates the development and deployment of applications by providing operating system support and software development frameworks. This eliminates the cost and complexity of managing the underlying hardware and software layers. PaaS is a cloud service targeting developers. IaaS comprise computing resources like computational power (processors) and data servers that can be virtualized and instances provided as a service. Table 1 below gives a summary of service models and some of the service providers and their products.

Table 1. Cloud Service Models

Service model	Providers	Services
SaaS	SalesForce.Com	SalesForce.com
	Google	Google Apps
PaaS	Google	GoogleAppEngine
	Microsoft	Microsoft Azure
	SalesForce	Force.Com
IaaS	Amazon	Amazon EC2/S3
	Zenith	Proud

The cloud computing deployment models can be classified based on three features. These are physical location and distribution [4]; and the owner of the cloud data centre [36]. In this sense, a cloud can be classified as private, public or hybrid [4]. The cloud deployment models are service-agnostic, implying that each service model can be deployed as private, public or hybrid cloud. Cloud computing offers a unique way to consume computation, network, storage and software resources. The characteristics of cloud computing are: 1) On-demand self- services where a consumer can unilaterally provision computing capabilities without the provider's intervention; 2) Broad network access which provides capabilities over the internet for different users and services; 3) resource pooling by the service provider to be used on a need basis by the consumers; and 4) a measured service which consumers are billed just like electricity consumption.

1.2. Selected Firms

Firms in the financial, information and Communications technology (ICT) and manufacturing were selected for this study. These industries were selected for this study because they have been identified as the early adopters of cloud computing globally with an average of 7.24 cloud apps adopted per business unit compared to an of average of 5.4 for all industries [37]. A study done in South Africa also indicates that the ICT sector was leading in cloud computing adoption at 54% followed by manufacturing sector at 47% and the financial sector at 33% [17].

The adoption of cloud computing in Kenya is still emerging. A cloud computing in Kenya report indicates that adoption of cloud computing is fairly recent with first adopters appearing in 2010 [38]. Since Kenya has been the finest in ICT innovation in Africa and home to multiple regional hubs including IBM's first African research lab and Google's first sub-Saharan African office [39], it is well positioned for cloud computing adoption. The report by Omwansa et al. (2014) confirms this as it states that 90% of the respondents thought that the cloud services market is ready in Kenya. The report further states that 48% of small and medium enterprises in Kenya have adopted cloud computing with a further 28% planning to adopt in the near future. Enterprises and institutions in the financial, ICT and manufacturing sectors are expected to be amongst the 48% of the early adopters. In Kenya, the finance sector, has 44 banking and mortgage institutions; 9 microfinance institutions [40]; and 71 insurance companies [41]. The ICT sector is the largest among the three with a total of 1,278 firms [42]. Lastly, there are 627 large scale manufacturing firms in Kenya [43].

2. Literature Review

2.1. Theoretical Literature

In an attempt to address the need to understand IT innovations adoption, extant studies have mainly employed the economic-rational and the socio-cognitive models [19]. The economic-rational models have recently been labelled the "dominant paradigm" [20] because these models have dominated the IT innovation research for the last two decades [44]. According to the economic-rational models, an organization's decision to adopt an IT innovation is determined by both the characteristics of the technology and the organizational contexts. It is assumed that organizations having an innovator's profile which include size, diversity, technical expertise and supportive senior management will exhibit a greater quantity of innovation [20]. Regarding the technology context, it is assumed that the attributes of a technology, for example, relative advantage, compatibility, triability, observability and complexity [21] determines an organizations decision to adopt the innovation. Generally, The economic-rationalistic school posits that decision makers adopt an innovation because of the expected efficiency or returns [45].

While the economic-rationalistic models have reasonably worked well in answering the questions they are intended to answer [20], their linear discourse has been criticized as "overrationalized" and fails to provide plausible explanations for the institutional and technical complexities of modern organizational environments [46]. Furthermore, they have been seen as being pro-innovation and adopts a perspective that privileges the new over the taken for granted, adoption over rejection and factor over process [47]. According to Fichman [20], the economic-rationalistic paradigm has accomplished high predictability and that the paradigm itself "may be reaching the point of diminishing returns" and suggests that IT innovation research should go beyond the organizational boundaries. Furthermore, there is need to theorize the IT artifact [48] as a multilevel product of local and trans-organizational forces acting in concert [49]. In order to step out of the organizational boundaries in IT innovation research, Fichman [[20], p. 315] and P. Wang [[19], p. 4] proposed the socio-cognitive approach as a possible avenue. According to the social-cognitive perspective, the adoption and diffusion of IT innovation among organizations is socially constructed by the technology discourse, as well as shared norms, values and beliefs about the innovation (Yang & Hsu, 2011). The main socio-cognitive theories include; institutional theory [24], power and trust [25]; organizing vision [27,28], management fashion [26] and innovation concept [19].

To understand cloud computing adoption within organizations, this study adopted the organizing vision perspective as an alternative to the economic-rationalistic approach. Underlining the organizing vision perspective is the fact that the processes behind choosing to adopt a technology as well as its implementation within an organization must not be dissociated from outside discourses relayed by the general environment surrounding the organization [50]. Further, an organizing vision of cloud computing as a new and novel IT paradigm plays a necessary role in driving the innovation adoption and diffusion processes. According to Swanson and Ramiller [28], an organizing vision represents the shared understanding of the organizational application of IT innovations that are established, maintained and transformed through community discourse. An organizing vision is therefore a socially constructed, evolving knowledge structure held by a community about an IT innovation [51]. This community comprises technology vendors, consultants, journalists, (potential) adopters, and academics, all united by a common interest in shaping the vision [52]. The discourse is promulgated amongst stakeholders through outlets like the newspapers, magazines, books, whitepapers, professional forums, speeches and advertisements.

The major theoretical arguments and empirical findings demonstrate that IT innovation is not only an organizational endeavour but also a community undertaking beyond organizational boundaries [19]. The organizing vision manifests itself in the development of an IT innovation vision, which is a community's idea of the interpretation and utilization of the innovation [19]. The popularity of an innovation's vision renders legitimacy to those adopting the innovation [53], [54]. According to Bikhchandani et al [55], managers resort to innovation vision popularity to infer the utility of an innovation when faced with ambiguity and uncertainty about it. According to P. Wang [52] organizing visions shape the diffusion of IT innovations in three ways. First, a vision interprets the innovation's nature and purpose. Second, the vision develops the underlying rational to legitimate the innovation as a good organizational practice attuned to business needs. Third, the vision helps mobilize the entrepreneurial and market forces to support the material realization of the innovation.

The organizing vision's functions of interpretation, legitimation and mobilization combined shape how an IT innovation will be adopted and diffused. This shaping process begins with a social account- an interpretation- of the potential application of an IT innovation in the organization [56]. An organizing vision is not a static vision but one that keeps on changing. New contributors to the vision interpret and produce discourse based on the previous interpretations [57]. The discourse arising from the interpretation of an IT innovation within the organizing vision leads to the creation of an innovation concept. The innovation concept abstracts various interpretations of an IT innovation into a coherent meaning that facilitates adoption of the innovation by organizations [19]. It is therefore possible that the creation of a cloud computing concept through interpretation will lead to the adoption of cloud computing by organizations within an institutional framework.

H1: There is a relationship between interpretation and cloud computing adoption

Legitimation of an IT innovation is a process when the rational for adopting the innovation is being built and when questions of why it should be adopted are being addressed [58]. According to Tolbert and Zucker [59] legitimation of an innovation is achieved by grounding it into broader business concerns and demonstrating its relevance to prominent organizational needs. Legitimacy can also be bolstered by affiliating the practice with the reputation of social actors who promote and adopt it [60]. According to Yang and Hsu [18] legitimation gives managers reasons to adopt an IT innovation based on broader business considerations and the innovations value leading to the hypothesis that:

H2: There is a relationship between legitimation and cloud computing adoption.

The final function of the organizing vision which is mobilization, entails all activities leading to activating, motivating and structuring the entrepreneurial, institutional and market forces that emerge to support the material realization of an innovation [58]. According to Swanson and Ramiller [28], mobilization helps motivate, activate and structure the actions of entrepreneurs to establish the necessary infrastructure and amass resources required " for making the innovation a reality and putting it into practice" leading to the hypothesis that:

H3: There is a relationship between mobilization and cloud computing adoption.

The three functions of the organizing vision have been summarized as "know-what", "know-how" and "know-why" [26]. The functions of the organizing vision are interdependent on each other. While interpretation is closely related to the cognitive aspects of legitimation, mobilization is mutually interdependent on legitimation efficacy [61]. Furthermore, the manner in which these functions interact determines if an emerging IT innovation will become important and embedded and finally emerging and diffusing in the broader community or it will dissipate and become discredited or forgotten [28].

According to Wang [19], the interpretation function of the organizing vision serves the purpose of theorizing an innovation by abstracting various stakeholders diverse understanding of the innovation into a potentially coherent meaning. Besides meaning and interpretation, such theorization produces a quasi-theory that legitimates the innovation as an efficient solution to an important problem [116]. We therefore hypothesize that:

H4: There is a relationship between interpretation and legitimation.

The theorization of an innovation through interpretation creates an innovation concept. An IT innovation concept is a community idea about the development and utilization of the IT [19]. Given that an innovation concept carries an organizing vision for embedding and utilizing an IT in organizational structures and processes [28], it mobilizes material resources to realization the innovation [19]. Further, the innovation researchers has recently underscored the important role of discourse in enabling widespread diffusion of innovations [49,117]. Hence the hypothesis that:

H5: There is a relationship between legitimation and mobilization.

2.2. Empirical Literature

The organizing vision has become an important branch of IT innovation research in recent years [62]. When IT innovation occurs, community members immediately open up discussion on some issues, such as the uncertainty and prospect of innovation, and how to embed and utilize information technology in organizational structures and processes, thus forming a vision of IT innovation. According to Staw and Epstein [54], the popularity of an innovation's organizing vision renders legitimacy to those adopting the innovationa as it helps in the interpretation, legitimation and mobilization of the innovation. Bikhchandani et al [55], observed that managers resort to an innovation's vision popularity to infer the utility of an innovation when faced with ambiguity and uncertainty about it. A study by Gallaugher and Wang [63] reported that managers were willing to adopt web server products mentioned more frequently in the trade press.. Given that some IT innovations whose associated visions had been popular became institutionalized as indispensable (Fichman, 2004), managers may expect current popular innovations to have the same effect.

Further studies indicate that there is a positive link between an innovation's vision and innovation adoption in the early to mid phases of an innovation's life cycle [19]. A study on the organizing vision of cloud computing in Taiwan addressed the institutionalization of cloud computing and how it impacts on cloud computing adoption [18]. In a study to investigate the role of organizing vision on the adoption of reverse e-auctions the authors concluded that although an organizing vision is often viewed as a force for adopting technology it can also be limiting force that inhibits organizations from obtaining significant benefits from technological opportunities [64].

Recently, Tona and Carlsson [65], confirmed the role of organizing vision in motivating organizations to adopt mobile business intelligence (Mobile BI). The results of the study show that organizing vision does have a considerable impact on the early phases of the decision making process to adopt Mobile BI. A study on the adoption of cloud computing adoption by Danish municipalities' concluded that institutional processes in the form of organizing vision played an essential part in the early and late diffusion of IT innovations and in the creation and evolution of an organizing vision for a system such as Opus (cloud based platform) for Danish municipalities [66]. Missing in these studies is the role of organizing vision in the adoption of cloud computing by business organizations within the context of a developing country like Kenya. To extend the application of the concept of the organizing vision in IT innovation, this study explores the role of cloud computing vision in the adoption of cloud computing by firms in Kenya.

3. Research Methodology

3.1. Research Design

The study was grounded in theory by first constructing a priori model based on the constructs of the organizing vision; interpretation, legitimation, mobilization; and cloud computing adoption. In a bid to establish whether significant relationships existed amongst those constructs at the time of the study, a cross sectional survey was conducted. The cross sectional survey has been found to be robust for effects of relationship studies in previous information systems studies such as Teo et al. [67], Liang et al. [68] and Wolf et al. [69]. A model of the relationship between the exogenous variables (interpretation, legitimation and mobilization) and the endogenous variable (cloud computing adoption) was developed using the partial least squares structural equation modelling (PLS-SEM). PLS-SEM is a single systematic statistical technique for testing and estimating causal relationships amongst latent variables [70]. PLS-SEM was chosen for this study because it is considered more appropriate for exploratory research and shares the modest distributional and sample size requirements of ordinary least squares regression [71]. Further, PLS-SEM has been extensively applied in information systems research. In a study on the use of PLS-SEM in Management Information Systems Quarterly (MISQ), out of the 109 SEM based articles published from 1999 through to 2011, 65 (60 percent) of the articles applied PLS-SEM [72].

3.2. Model Development

A priori model was constructed using PLS-SEM to embody the relationship between the exogenous and the endogenous variables. A PLS-SEM model consists of the structural model which represents the relationship between the latent constructs and the measurement model which represents the relationship between the observable indicators and the latent variables [70]. The organizing vision theory guided the development of the structural model. The sub-constructs of the organizing vision theory comprising interpretation, legitimation and mobilization were used as the exogenous latent variables while cloud computing adoption as the endogenous latent variable. Each of the latent constructs was estimated using a number of reflective indicators since the use of reflective indicators is considered the norm in PLS-SEM studies [70]. The latent variable of cloud computing adoption was estimated as a second order reflective variable. The structural model in this study represents the causal relationships in terms of paths where each path is a hypothesis for testing a theoretical proposition [73]. The research model is represented by Figure 1.

Empirical literature that employed the organizing vision theory were examined for the validated indicators for interpretation, legitimation and mobilization constructs and cloud computing adoption. The measures were then adapted to suit the specifics of the study. Cloud computing adoption was captured by asking the respondents the level of adoption of any of the cloud computing offerings in the areas of Software as a Service (SaaS), Infrastructure as a Service (IaaS) and Platform as a Service (PaaS). A summary of how the indicators were operationalized is presented in Table 2.

3.3. Population, Sampling and Data Collection

The data for the study was collected from firms in the Kenya's financial, manufacturing and ICT sectors. The firms in the financial sector were identified from both the Central Bank of Kenya website (www.centralbank.go.ke) and the Insurance Regulatory Authority website (www.ira.go.ke). There are a total of 138 licensed firms in the financial sector with 53 of them being in the banking sector and 71 firms in the insurance sector. The firms in the ICT sector were identified from the list of licensed organizations in this sector available on the Communications Authority (CA) of Kenya website (www.ca.go.ke). Even though the firms are categorized according to the services they offer, this study selected firms from the category of content service providers. The category of content service providers provides a representative list of firms in the sector. According to CA, there are 221 licensed content service providers from a total of 1278 licensed firms in the ICT sector. In the manufacturing sector, a population of 627 large manufacturing firms formed part of the population. The large manufacturing firms were identified from the Kenya Manufacturing Association's handbook (KAM, 2011).

A random sample of 60 firms from each sector was selected for the study. The choice of the sample size was guided by the N:q ratio where N=number of cases and q= number of model parameters [74]. According to Kline [75], the recommended ratio for a structural equation modelling (SEM) study is 20:1. In this study, there are three model parameters to be estimated (interpretation, legitimation, mobilization and cloud computing adoption) and therefore a minimum sample size of 60 was required. An additional 120 firms were added to the recommended minimum sample size to take care of possible non response. Out of the 180 questions that were sent to respondents, 97 responses were received making a response rate of 53.8 percent. On examination of the completeness of the questionnaires, 15 were found to be incomplete. Of the 15 incomplete questionnaires, 4 were discarded as the respondents only filled the demographic items which comprised 40 percent of the total questionnaire items. The remaining 11 incomplete questionnaires were used as the respondents had answered most of the questions. To complete the missing values, a sub-group mean value replacement function was used [76]. After completing the missing values, the 93 questionnaires became usable. The response rates by industry in shown in Table 3.

The questionnaire instrument was administered online to the managers having ICT related responsibilities in each of the firms. The respondents consisted of Chief Information Technology Officers, ICT Managers, Information Systems Managers, Chief Information Officers, and Information Security Managers. An "Others" option was included in the questionnaire to cater for ICT responsibilities that are not captured by the above titles. The ICT managers were selected because they are not only boundary spanning [77] but they are also considered opinion leaders during IT innovation adoption decision processes within their firms [78]. Also, according to Ezell [[79], p. 66], IT managers deal directly with technological and organizational issues on a daily basis and attempt to resolve those issues through well informed choices and the capability and applicability of IT innovations. Further, prior research in management suggests that the perceptions of top management reflects the collective perspective of the organization and therefore the subjective opinions of top managers are held as reliable sources of firm level data [80].

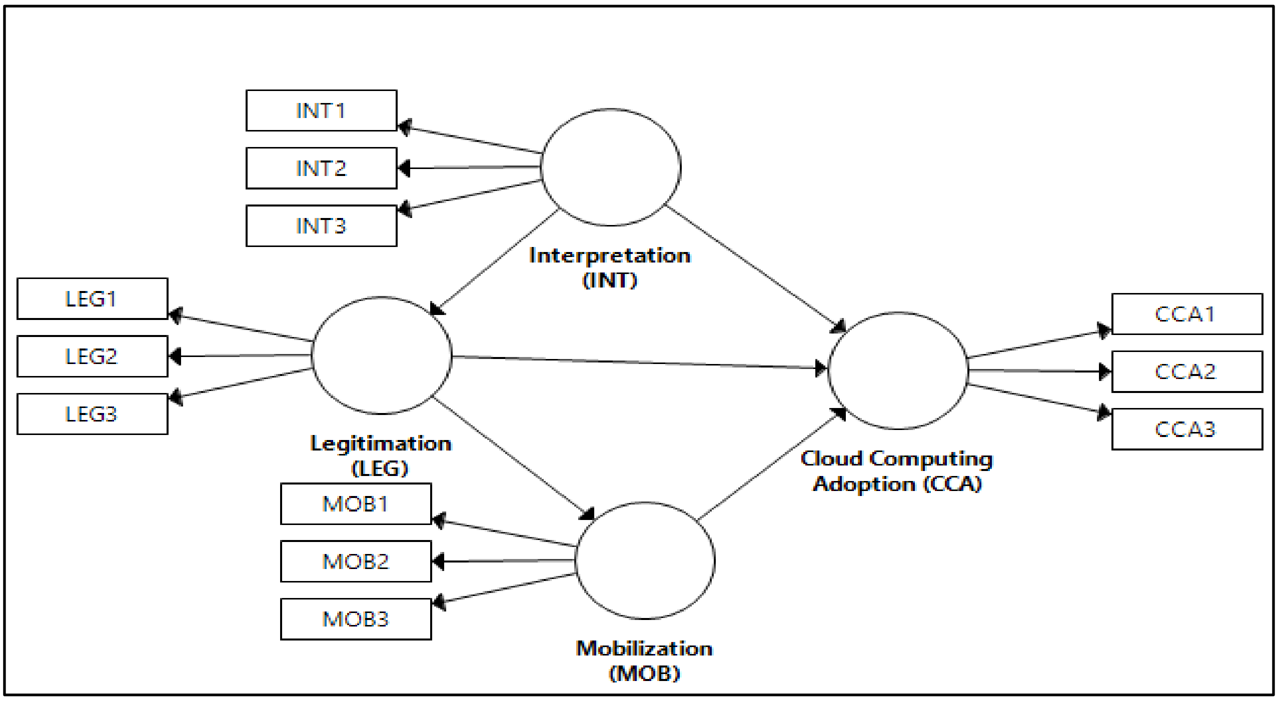

Figure 1. Research Model

Table 2. Operationalization of Latent Variables

Latent Variables	Indicators	Literature
Interpretation	We as an industry have a common understanding of cloud computing (INT1).	[57]
	Good information on cloud computing is easily available (INT2).	
	Key players in the industry continually discuss cloud computing(INT3).	
Legitimation	They define key features and usage of cloud computing (LEG1). The vendors discuss challenges associated with cloud innovation (LEG2).	[60]
	They explain how cloud innovation improves the business performance when adopted by an organization (LEG3)	
Mobilization	They provide relevant training regarding cloud computing (MOB1)	[19]
	They provide consulting services to organizations interested in adopting cloud computing (MOB2)	
	They provide technical and knowledge support to cloud computing adopters (MOB3)	
Cloud Computing Adoption	Adoption Software as a Service (SaaS) (CCA1)	[18], [32], [34]
	Adoption of Platform as a Service (PaaS)(CCA2)	
	Adoption of Infrastructure as Service (IaaS)(CCA3)	

Table 3. Response Rates by Industry

Industry	Mailed	Response	Response Rate (Industry)	Response Rate (Overall)
Financial	60	33	55%	18.3%
ICT	60	48	80%	26.6%
Manufacturing	60	11	18%	6.1%
Total	180	92		51%

The questionnaire was administered to the respondents online. The web based questionnaire was designed using Survey Monkey® and sent to the respondents as a link through their email addresses. Though internet based surveys are similar to surveys with mail questionnaires, the former are considerably faster [81] and more cost effective [82]. Additional advantages of email and web based questionnaires over snail mail questionnaires is that they are environment friendly [81], allow multimedia content [83] and offer easier data translation [84]. In administering the web questionnaire, an initial email invitation was sent to the sampled respondents. After the initial invitation, four rounds of reminders were sent out with different formulations of invitation text to improve the response rate as recommended by Sivo [85].

4. Data Analysis and Results

4.1. Analysis Strategy

The research model and the hypotheses generated from it were tested by means of structural equation modelling as implemented in SmartPLS 3.0 [86] which is based on partial least squares. Structural equation modelling is a type of second generation multivariate statistical analysis [73] that has attracted great interest in information systems research [70,87]. The technique was used to estimate the relationships amongst interpretation, legitimation, mobilization and cloud computing adoption. SEM was used in this study because it has potential advantages over regression analysis. SEM is the method of choice when it comes to analyzing path diagrams which have latent variables with multiple indicators [88]. SEM comes with the power to integrate the measurements (measurement model) and the hypothesized causal paths (structural model) into a simultaneous assessment. This process makes the estimation produced by SEM better than those produced by linear regression when the distribution assumptions hold [88]. The test of the research model involved assessing both the measurement (outer model) and the structural model (inner model).

4.2. Model Evaluation

4.2.1. Measurement Model Evaluation

The reliability and validity of the measurement model was assessed at the indicator level following Henseler et al. [89]. Since all the study constructs were operationalized as reflective indicators, reliability and validity were assessed through internal consistency reliability, indicator reliability, convergent validity and discriminant validity as recommended by Straub et al. [90] and Lewis et al. [91]. Internal consistency reliability which measures the degree to which the indicators load simultaneously when the latent variable increases was evaluated using composite reliability (CA) with a threshold value of 0.700 and above [92,93]. Convergent validity estimates in comparison to items measuring different constructs [70]. Convergent validity was assessed using the average variance extracted (AVE) proposed by Fornell and Larcker [94]. The AVE is the average amount of variance in indicator variables that a construct is managed to explain and the recommended threshold value is above 0.500 [92,93]. The indicator reliability which measures how much of the indicators variance is explained by the corresponding latent variable was evaluated using cross loadings with a threshold value of 0.700 or slightly lower for exploratory studies [95]. The values for CA, AVE and the cross loadings CCA is summarized in Table 4.

Table 4. Indicator reliability, internal consistency and convergent validity assessment

Latent Variable	Indicators	Indicator Reliability	CA	AVE
Interpretation	INT1	0.782	0.821	0.605
	INT2	0.782		
	INT3	0.769		
Legitimation	LEG1	0.831	0.818	0.603
	LEG2	0.661		
	LEG3	0.825		
Mobilization	MOB1	0.830	0.891	0.731
	MOB2	0.866		
	MOB3	0.869		
CCA	CCA1	0.905	0.939	0.593
	CCA2	0.944		
	CCA3	0.895		

Lastly, the discriminant validity was also evaluated. Discriminant validity concerns the degree to which the measures of different constructs differ from one another [70]. With discriminant validity, cross loadings are obtained by correlating the component scores of each latent variable with all other items and it should be that the loading for each indicator is highest for its designated construct than for any of the other constructs [93,95]. All of the indicators met the requirement for discriminant validity as shown in Table 5.

Table 5. Discriminant Validity

	Cloud Computing Adoption (CCA)	Interpretation (INT)	Legitimation (LEG)	Mobilization (MOB)
CCA1	**0.905**	0.188	0.245	0.134
CCA3	**0.944**	0.000	0.268	0.199
CCA4	**0.895**	0.060	0.164	0.159
INT1	0.080	**0.782**	0.549	0.229
INT2	-0.074	**0.782**	0.451	0.125
INT3	0.143	**0.769**	0.504	0.344
LEG1	0.095	0.604	**0.831**	0.525
LEG4	0.274	0.408	**0.661**	0.373
LEG7	0.257	0.478	**0.825**	0.385
MOB2	0.309	0.299	0.443	**0.830**
MOB4	0.040	0.264	0.569	**0.866**
MOB5	0.129	0.212	0.401	**0.869**

4.2.2. Structural Model Evaluation

Following the successful evaluation of the measurement (outer) model evaluation, the structural (inner) inner model was analyzed. The first criterion to be analyzed was the relationship between each of the latent variables' explained variance to its total variance using the coefficient of determination (R^2) criterion. The values should be sufficiently high for the model to have a minimum level of explanatory power [70]. The acceptable R^2 according to a rough rule of the thumb is 0.750, 0.50 and below 0.25, respectively describing substantial, moderate or weak levels of predictive accuracy [92,89]. The R^2 for the structural model was 0.082 (CCA), 0.422 (LEG) and 0.313 (MOB). The R^2 for cloud computing adoption (CCA) indicated a weak explanatory power compared to those of legitimation (LEG) and mobilization (MOB) that showed a moderate predictive power. The path coefficients (β) between the model's latent variables were then checked for algebraic sign, magnitude and significance. All the path coefficients were more than the absolute 0.100 except that of mobilization (MOB) and cloud computing adoption (CCA). All the path coefficients that are more than the absolute 0.100 accounted for a certain level of impact within the model [70] as indicated in Figure 2.

Further, the path coefficients were examined for significance at 10% and 5% following Latan and Ghozali [93]. The significance levels were determined using the bootstrapping technique [96]. The bootstrapping algorithm used employed 500 subsamples and generated the T statistics and p values after running 300 iterations as shown in Table 6. The path coefficient for the relationship between interpretation (INT) and legitimation (LEG); and legitimation (LEG) and mobilization (MOB) were both significant at 5%.

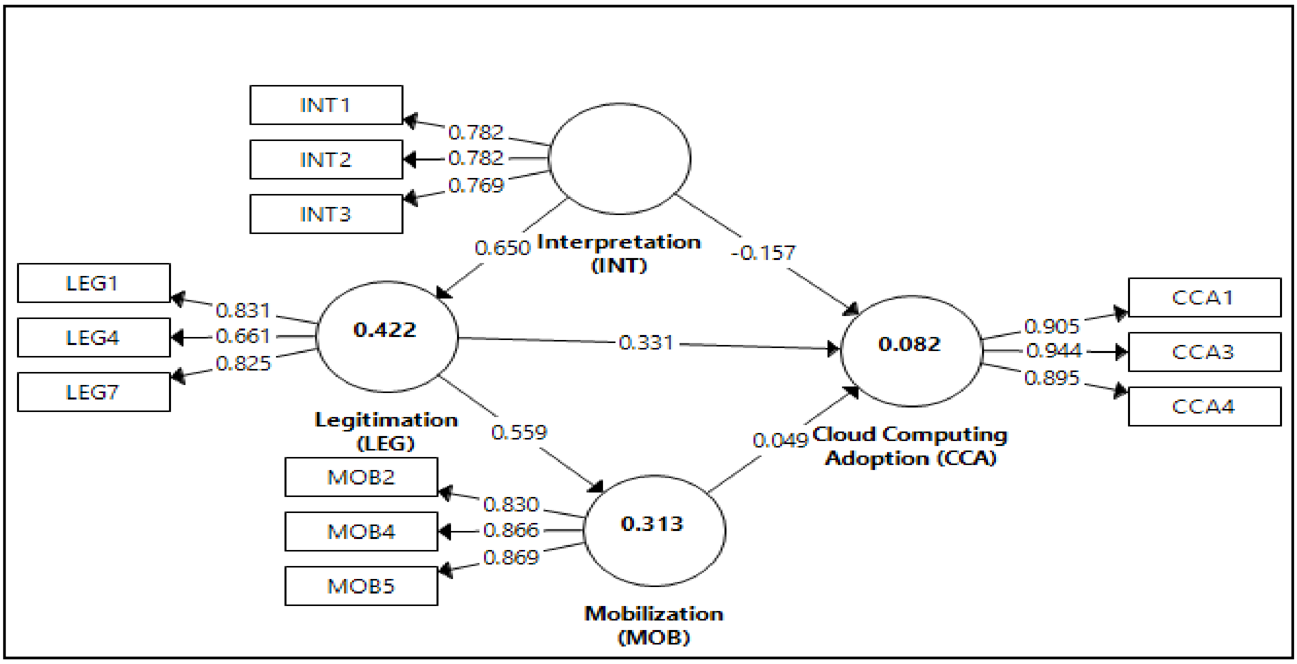

Figure 2. Path Coefficients and R Squared

Table 6. Tests of Statistical Significance

	β	STDEV	T Statistics	P Values
Interpretation (INT) -> Cloud Computing Adoption (CCA)	-0.157	0.226	0.693	0.488
Interpretation (INT) -> Legitimation (LEG)	0.650	0.066	9.863	0.000
Legitimation (LEG) -> Cloud Computing Adoption (CCA)	0.331	0.230	1.439	0.151
Legitimation (LEG) -> Mobilization (MOB)	0.559	0.092	6.054	0.000
Mobilization (MOB) -> Cloud Computing Adoption (CCA)	0.049	0.160	0.307	0.759

In a bid to establish if the each of the independent latent variables had a substantial impact on the dependent latent variables, effect size (f^2) was estimated. According to Chin [95], Cohen [97] and Gefen et al. [88] effect sizes of 0.020, 0.150 and 0.350 indicate the predictor variable's low, medium or large effect respectively on the structural model. . The Cohen's f^2 was estimated by means of bootstrapping and the results are summarized in Table 7. The latent variables interpretation (INT), legitimation (LEG) and mobilization (MOB) had small effect size on cloud computing adoption (CCA). Interpretation had a large effect size on legitimation (LEG) while legitimation (LEG) also had a large effect size on mobilization (MOB)

Table 7. Tests for Effect Size

	(CCA)	(LEG)	(MOB)
Interpretation (INT)	0.015	0.730	
Legitimation (LEG)	0.052		0.455
Mobilization (MOB)	0.002		

The last structural model validity criterion that was evaluated is the predictive relevance of the exogenous latent variables on the endogenous latent variables. This criterion was evaluated using the Stone-Geisser's Q^2 test. This test uses a blindfolding procedure to create estimates of residual variances [98]. Given that the total number of observations in the study was 93 (n=93) , the omission distance in the blindfolding setup was set to 7 following the recommendation of Hair et al. [[99], p. 167] that the omission distance should be between 5 and 7 and that the number of total observations used in the model estimation divided by the omission distance (d) is not an integer (n mod d=0). The Q^2 values of all the latent variables INT, LEG, MOB, and CCA were above 0 (Q^2 >0) threshold suggested by Fornell and Cha (as cited in Urbach and Uhlemann, [70]. The Q^2 value 0.031 implies that the latent variables INT, LEG, MOB have some predictive relevance on CCA. Further, the value 0.228 indicates the predictive relevance of INT on LEG and the value 0.197 shows the predictive relevance of LEG on MOB. Table 8 summarizes the tests for predictive relevance.

Table 8. Tests for Predictive Relevance

	SSO	SSE	Q^2 (=1-SSE/SSO)
Cloud Computing Adoption (CCA)	279.000	270.445	0.031
Interpretation (INT)	279.000	279.000	
Legitimation (LEG)	279.000	215.341	0.228
Mobilization (MOB)	279.000	224.102	0.197

4.3. Hypothesis Testing

To achieve the study's objective, a test of hypotheses was carried out. The hypotheses were formulated based on relevant theories and previous empirical studies. Partial least squares SEM as implemented in SmartPLS 3.2.1 was used to test the hypotheses. A summary of the results of the latent variables' path coefficients, T statistics, p-values and effect sizes are presented in Table 5 and Table 6.

The first hypothesis of the study is that there is a relationship between interpretation (INT) and cloud computing adoption (CCA). The hypothesis was formulated based on relevant theories and extant empirical studies. The latent variable interpretation (INT) was specified in terms of three reflective indicators. The measure for path coefficient was β=-0.157, t=0.693(p=0.488, α=0.05) and f^2=0.015. The relationship between interpretation (INT) and cloud computing adoption (CCA) was found not to be significant ($t < 1.96$). The hypothesis that there is a relationship between interpretation (INT) and cloud computing adoption (CCA) was not supported.

The second hypothesis was that there is a relationship between legitimation (LEG) and cloud computing adoption (CCA). The latent variable legitimation was specified in terms of three reflective indicators. The measures for path coefficient was β=0.331, t=1.439(p=0.151, α=0.05) and f^2=0.052. The relationship between legitimation (LEG) and cloud computing adoption (CCA) was found not to be significant ($t<1.96$). The hypothesis that there is a relationship between legitimation (LEG) and cloud computing adoption (CCA) was not supported.

The third hypothesis was that there is a relationship between mobilization (MOB) and cloud computing adoption (CCA). The latent variable mobilization (MOB) was specified in terms of three reflective indicators. The measure for the path coefficient was β=0.049, t=0.307 (p=0.759, α=0.05) and f^2=0.002. The relationship between mobilization (MOB) and cloud computing adoption (CCA) was found not to be significant ($t<1.96$). The hypothesis that there is a relationship between mobilization (MOB) and cloud computing adoption (CCA) was not supported.

The fourth hypothesis was that there is a relationship between interpretation (INT) and legitimation (LEG). The measure for the path coefficient was β=0.650, t=9.863(p=0.000, α=0.05) and f^2=0.730. The relationship between interpretation (INT) and legitimation (LEG) was found to be significant ($t>1.96$). The hypothesis that there is a relationship between interpretation (INT) and legitimation (LEG) was supported.

The last hypothesis was that there is a relationship between legitimation (LEG) and mobilization (MOB). The measure for the path coefficient was β=0.559, t=6.054 (p=0.000, α=0.05) and f^2=0.445. The relationship between legitimation (LEG) and mobilization (MOB) was found to be significant ($t>1.96$). The hypothesis that there is a relationship between legitimation (LEG) and mobilization (MOB) was supported.

5. Discussion of the Results

The purpose of conducting research is to understand and extend the body of knowledge in a particular disciplinary domain. To this end, this section aims at discussing the results of this study in relation to extant theoretical foundations and empirical evidence on IT innovation adoption in general and cloud computing adoption in particular. The main objective of this study was to examine the interrelationships amongst organizing vision functions and cloud computing adoption. The organizing vision of cloud computing was conceptualized in terms of latent variables (constructs) with reflective indicators. The latent variables were interpretation, legitimation and mobilization. The specific objectives of the study were to establish the relationship between; interpretation and cloud computing adoption; legitimation and cloud computing adoption; mobilization and cloud computing adoption; interpretation and legitimation; and interpretation and mobilization.

The first point of discussion regards the reliability and validity of the proposed research model (Figure 1). In general, the proposed research model framework meets an adequate level of statistical fit (Figure 2). The model predictive relevance for all the latent variables estimated through the Stone-Geisser's Q^2 test yielded a result of $Q^2>0$ (Table 8) as recommended. This indicates that in general, the research model is coherent and has predictive relevance when applied to selected firms in Kenya. The research model was grounded in the organizing vision theory and its role in cloud computing adoption. The organizing visions emerge as community discourse incrementally establishes, transforms, refines and maintains shared understanding concerning the organizational applications of ICT innovations [60]. The results of a literature review conducted by [100] on various empirical studies on cloud computing showed that the various institutional actors; cloud computing vendors, peer organizations, business partners, professional and business associations and industry regulators played influential roles in cloud computing adoption. The roles played by these inter-organizational players creates a cloud computing organizing vision through the interpretation, legitimation and mobilization of cloud computing innovation. According to a study by Marsan and Pare [101] on the adoption of open source systems (OSS), lack of clarity, consistency, and richness of discourse hinders the adoption of an IT innovation. The study also concluded that decision to adopt an innovation is positively influenced by the popularity of the innovation as a subject matter of discussion, the interest of the potential adopters and other stakeholders in the public discourse on the IT innovation.

The first hypothesis that interpretation has a relationship with cloud computing adoption was not supported. Interpretation is the focal communities' discourse focused on cloud computing ontology and how cloud computing can be used. its use. The negative influence of interpretation on cloud computing adoption by organizations in Kenya can be attributed to the lack of clarity, consistency and richness of cloud computing discourse in Kenya. A study conducted in Kenya indicated that 39.29 percent of respondents ranked cloud computing vendors at position 1 out of 8 as their main source of cloud computing information while professional associations and industry associations that should be leading in the discourse about IT innovations were ranked in position 1 out of 8 by an average 16% of the respondents [[102], p. 69]. Reliance on vendors as the main source of information about an innovation may lead to a lack of clarity about an innovation's purpose as a result of powerful institutional interests [103]. Poor understanding of what cloud computing and its uses may have also contributed to the insignificant relationship between interpretation and cloud computing adoption. A study on the relationship between the slow computing adoption and the IT workforce cited lack of a unified understanding or interpretation of cloud computing; and lack of awareness about cloud computing by IT workforce as hindrances to cloud computing adoption [104]. The problem of lack of a unified interpretation and lack of awareness can be attributed to insufficient media coverage of cloud computing adoption initiatives by reputable organizations locally. According to Hu et al. [105], media coverage of IT innovation adoption serves to strengthen the effects of mimetic pressures. The mimetic pressures can facilitate uniformity in interpretation of an IT innovation.

The second hypothesis that legitimation has a relationship with cloud computing adoption was not supported. The legitimation indicator of the cloud computing vision measured the extent to which cloud computing discourse has been linked to the business concerns. It focused on the role of cloud computing vendors, promulgators and adopters with a high reputation and authority who exert normative influence [[106], p. 197]. The role of legitimation on cloud computing adoption may have been insignificant since the legal and regulatory issues of cloud computing adoption are not yet clear to many business organizations in Kenya. It is known that lack of regulation or the fear that cloud computing not being regulated soon enough made people too thoughtful to spend their money on cloud services [104]. A study by Wang [19] on the adoption of ERP found out that the popularity of an innovation is enhanced by the prevalence of business problems it claims to solve. The absence of significant effect of legitimation on cloud computing adoption may then be attributed to the fact that cloud vendors have focused more on the technical advantages of the innovation rather than the business advantages [107]. Additionally, despite the efforts made by vendors like IBM and HP, many IT professional do not have an in depth understanding of the cloud nor are they aware of its business benefits [14].

The hypothesis that there is a relationship between mobilization and cloud computing adoption was not significant. The organizing vision of a particular innovation serves the dynamic function of helping to activate, motivate and structure the entrepreneurial and market forces [108] that emerge to support the material realization of the innovation. In this case, would be adopters look to the market for needed resources including hardware, software, and skills to materialize the IT innovation. Mobilization also involves aligning the diverse interests of heterogeneous organizational actors and getting them to willingly participate in specific ways of thinking and acting [109]. The absence of a significant relationship between mobilization and cloud computing adoption may be attributed to inadequate cloud computing skills force and lack of active involvement of industry associations in engaging their members on matters of cloud computing. A number of studies on cloud computing adoption in Kenya have always recommended active involvement of the government and relevant regulatory bodies in facilitating cloud computing adoption [110,111,112]. Cloud vendors like IBM are increasingly expanding their operations in Kenya and participating in the development of skills relevant for cloud operations [113]. A study on diverse IT innovations confirmed that materialization of an IT innovation can be activated through trade shows to enable potential adopters see its practical business applications [114]. These trade shows were used to refine the existing interpretation and inconsistencies in the innovation's organizing vision and to mobilize resources for diffusion

The relationship between interpretation and legitimation was found to be significant. The process of interpretation entails learning undertaken by the prospective adopters and it is tied to the learning unfolding in the larger community [115]. Through learning, organizations get to understand the ontology and utility of an IT innovation. Armed with appropriate understanding of cloud computing, organizations can legitimize its appropriateness in terms of business needs. According to a study on the organizing vision of telehealth [58], the process of interpretation is complicated by legitimation, creating the relationship between interpretation and legitimation. The last hypothesis that there is a relationship between legitimation and mobilization was found to be significant. Once an organization recognizes that an IT innovation is an efficient solution to an important business problem, it can easily mobilize the material resources needed to materialize the innovation.

6. Conclusion

The objectives of this study were to understand the relationship amongst the organizing vision functions and cloud computing adoption. These relationships were captured using a priori research model. The study confirms that organizing vision is still relevant for understanding and explaining IT innovation adoption by business enterprises. The findings of this study should be interpreted and generalized in the light of a number of limitations. Since the study was conducted in Kenya and the sample selected from the financial, ICT and manufacturing firms; the generalizability of the results may be limited to Kenyan organizations and those firms in similar institutional contexts. The approach of sampling firms from different sectors instead of a single sector was adopted due to the fact that cloud computing adoption is still at the early stages in Kenya, making it difficult to collect adequate data from a single sector or industry. The study used self reported data from managers with ICT related responsibilities which may have resulted to either acquiescent responding or reactant responding [118].

To better understand constructs like interpretation, legitimation and mobilization as functions of the organizing vision, a process approach should be taken. Future studies should explore the use of longitudinal survey to study these constructs. Granted that longitudinal surveys are not the panacea to measurement challenges in IS research, the longitudinal survey represents a logical extension of the cross-sectional study and provides a useful approach for studying change and adaptation in IS domains [119]. Furthermore, not all the "cloud service providers" owns and operates a data centre. Many of them are intermediary service providers or more specifically, cloud service brokers. Further studies should explore the role played by cloud brokerage service companies and the value they add in the cloud value chain.

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