

Cloud Computing and Competitive Advantage in Small and Medium Enterprises (SMEs). A Review Paper

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Abstract

Cloud computing was designed for convenience, agility, scalability, cost-effectiveness and business efficiency in businesses. SMEs might no longer own on-site computing resources since they are provisioned by third party providers. Cloud computing model has: firstly, five essential characteristics; on-demand self-service, broad network access, resource pooling, rapid elasticity and measured service; secondly, three main service models; Software as a service, Platform as a Service, and Infrastructure as a Service, and; thirdly, deployment models; private, community, public and hybrid clouds. The cloud's metered services minimize SMEs' expenses and the time-related constraints, mainly at start-up. Cloud's elasticity enables rapid scaling of resources as SMEs grow and provide competitive advantage in dynamic, turbulent business environment. The study established a conceptual model that shows the relationship between cloud computing capabilities, SME characteristics, business environment, management decision-making processes and the competitive advantage of the SMEs. This study's theoretical framework was anchored on; resource-based view, dynamic capabilities theory, innovation configuration theory and technology destiny theory. The study's findings will enrich the IS research knowledge, may be applied by researcher's and business practitioners.

Keywords

Cloud Computing Model, SMEs, Competitiveness, Business Environment

1. Introduction

Cloud computing promotes growing access to computer resources ubiquitously

where the cloud resources suppliers are responsible of storage, updating, maintaining and ensuring security of the resources. On the cloud one only uses the services one needs when one needs them. This allows the SMEs to execute complex and expensive applications and operations with outsourced IT services, hence reducing the overheads of a dedicated organizational computing facility. Cloud computing can reduce the requirement for hefty SMEs' start-up capital and start-up times (Ristova, Panov, Gecevska, & Stefanovska, 2012; Bushhousen, 2011). Cloud computing can help expand the capabilities and capacities of the SMEs, lower cost of doing business and improve their return on investments thus improving SMEs' competitiveness (Alshamaila, Papagiannidis, & Li, 2013; Kasse, Nakawoya, Balunywa, & Nansubuga, 2015).

The study delved on SMEs because of their relevance in the growth and development of world's economies. Information Systems scholars could not agree as to whether IT can provide a sustainable competitive advantage, especially for the majorly ubiquitous IT that is now readily available to organizations that could not have afforded such IT systems in the past. However, although IT is ubiquitous some studies stressed that competitive advantage would be realized depending on how IT is deployed in addressing an organization's special strategic needs (Arora & Rahman, 2017). The contribution of cloud computing on SMEs has not been fully studied and understood hence requiring studies to establish the true benefits and costs of cloud computing (Behrend et al., 2011; Sultan, 2011), moreover, Melville et al. (2004) posited that IT competitive advantage and implications are yet to be fully studied and understood.

Therefore, this study assessed how cloud computing impacts SMEs' competitiveness. Moreover, the study explored theoretical and conceptual framework relevant in describing how cloud computing architectures interacts with the organizational infrastructure and the organization's business environment to influence organizational growth, development and survival in a rather rapidly changing environment (Sahandi, Alkhalil & Opara-Martins; Alshamaila, Papagiannidis, & Li, 2013).

1.1. Cloud Computing (CC)

Cloud computing is an information technology platform built in warehouse-size data centers with huge servers capable of rapidly proffering vast scope of application solutions to the users over the Internet (Jaeger, Lin, & Grimes, 2008). Cloud computing is a paradigm shift in computing enabling ubiquitous, convenient, scalable, "on-demand network access to shared pool of configurable computing resources" (e.g., networks, servers, storage, applications, and communication services) "that can be rapidly provisioned and released with minimal management effort or service provider interaction" (Luo, 2012; Mathur & Verma, 2014; Reis, Fraga, & Gouveia, 2025). The cloud model comprises the five essential characteristics, three service models, and four deployment models (Mathur & Verma, 2014). Cloud Computing is a parallel and distributed system of virtually intercon-

nected computers interconnecting affordable and high capacity CPUs, storage devices and high-bandwidth telecommunication links (Dachyar & Prasetya, 2012; Alshamaila, Papagiannidis, & Li, 2013). Service models of Cloud are; Infrastructure as a Services (IaaS), Software as a Service (SaaS), and Platform as a Service (PaaS), the cloud deployment models has; private, public, community, and hybrid (Bushhousen, 2011).

Currently cloud computing is being commercially applied to offer services such as; database management, data mining, genomics and deployment of web services, which reduces the need for hefty start-up capital or prolonged start-up times for new businesses (Ristova et al., 2012; Behrend et al., 2011). Moreover, cloud computing redirects the users' efforts to focus more on core competences and less on up-front capital investment for purchasing, configuration, administering, and maintaining own computing resources. Hence, enabling clients to achieve the envisaged productivity levels and improve their businesses, and minimizes production costs and lowers barriers-to-entry even for the highly capital-intensive operations (Jaeger, Lin, & Grimes, 2008; Mathur & Verma, 2014). The implementation of the clouds technology reduces costs for large enterprises just as for SMEs (Fichman, 2004), but the cost advantages are more pronounced and felt by SMEs since large enterprises may be already enjoying substantial economies of scale with their existing internal IT capacities (Alshamaila, Papagiannidis, & Li, 2013).

1.2. Small and Medium Enterprises (SMEs)

Technical definitions of SMEs are different in different countries, but the definitions are encompassing the levels of employment and capital outlay, or organizational assets. In Kenya, classification by the number of employees engaged by firms; ten to 49 workers and 50 to 99 workers are respectively classified as small-scale enterprises and medium-scale enterprises respectively, while the firms with over 99 workers are categorized as large-scale enterprises (Migiro & Wallis, 2006; Martin & Daniel, 2013). Washington, James and Peter (2014) defined SMEs using parameters such as owner management, size of business, turnover levels and number of employees. According to Charles, Patrick & Oima (2012) SMEs are the "major contributors to the socio-economic development of the nation". He opined that in Kenya "in 2007, employment in the small enterprises sector accounted for approximately 79% of total employment and approximately 18% of country's Gross Domestic Product (GDP)".

"In the year 2012, the small enterprise sector created up to 80% of the total employment and contributed between 18 to 20% to the GDP in Kenya". Migiro & Wallis (2006) approximated contribution of SMEs to the country's GDP to be more than double contribution of the large sector. Moreover, in the Kenyan economy the SMEs dominate the indigenous private sector (Martin & Daniel, 2013). European Commission uses the total employees' headcount and business turnover to categorize SMEs: Micro-enterprises—businesses with less than 10 employees; Small enterprises—businesses with up to 50 employees; Medium-sized enter-

prises—with less than 100 permanent employees. SMEs have a Financial Worth or Capital outlay of Kes 5-50 million. SMEs contribute 60% of GDP in the European Union (EU) hence a major stakeholder in the economic growth even in the most developed economies (Martin, 2011).

SMEs are important as on average they comprise over 95 percent of the developing countries' economy, composing the bigger chunk of source of citizens' income, a breeding ground for entrepreneurs, a provider of employment and also a major contributor to the developing countries' GDP (Alshamaila, Papagiannidis, & Li, 2013). In case of the business environmental changes the SMEs feel the impact more than the larger enterprises since the SMEs have limited resources, inflexibility and are not able to obtain the required expertise as and when needed (Fichman, 2004; Hamburg & Bucksch, 2016). SMEs' distinguishing factors greatly influence the level of ICT usage (Olise, Anigbogu, Edoko, & Okoli, 2014). Nonetheless, just being small, large, having huge or meager computing resources may not make an organization to either uptake or refrain from cloud resources (Misra & Monda, 2011), hence, there is need for this study of the cloud computing innovation, and how it is shaping the SMEs' competitive landscape (Fichman, 2004; Alshamaila, Papagiannidis, & Li, 2013).

1.3. Cloud Computing Capabilities

A cloud is a form of information technology. Therefore, ICT capability entails the ability of a firm to strategically adopt and use various technologies to meet business needs and counter emerging business challenges. ICT capability components include; internal efficiency, collaboration and communication capabilities. SMEs that possess high levels of ICT capacities have high potential to achieve greater levels of organizational dynamic capabilities through their internal resources (Parida et al., 2016). Dynamic capabilities refer to the ability of an organization to devise and adapt new resources and configure the resources already owned to deal with turbulences in the business environment. Efficient dynamic capabilities help an organization to use fewer resources to realize better and more results than its competitors, and also help the organization access and align with its products' markets more appropriately (Lin & Tsai, 2016). ICT capabilities encompass the use of basic technologies such as radio, fax, fixed lines, intranet, extranet, Internet to more advanced technologies such as the cloud computing, e-commerce and information processing systems such as Customer Relationship Management (CRM), Entity Relationship Planning (ERP) or Supply Chain Management (SCM).

Cloud computing resources are cost-effectively enjoyed from third party providers over the Internet, hence, improving SME's capability to compete with the relatively larger organizations. It facilitates capturing, storing, processing, transmitting and communicating information electronically, hence their capability to revolutionize the way businesses are conducted amongst SMEs by providing the required knowledge (software) and infrastructure (hardware) that is capable of

improving production processes, boosting SME's economic efficiency, productivity growth and competitiveness (Olise, Anigbogu, Edoko, & Okoli, 2014). SMEs that strive to attain a high level of ICT capabilities in return are able to effectively utilize their internal resources and achieve organizational dynamic capabilities. Dynamic capabilities enable the SME's; adaptive capability, absorptive capability, innovation capability and networking capability (Parida et al., 2016). ICTs are greatly influencing the world's economy by changing it from an industrial economy to a knowledge economy such that the SMEs who may lag behind in adopting ICTs may suffer social and economic exclusion due to a digital gap and have a hard time surviving in the national, regional or global business environments (Sevrani & Bahiti, 2008; Martin, 2011).

Cloud computing is a new disruptive information technology paradigm that is impacting the acquisition and usage of information systems (Prasad et al., 2010; Lin & Chen, 2012; Oredo & Njihia, 2015). Sahandi, Alkhalil & Opara-Martins (2013) found that the most important motivations for SMEs to use Cloud-based services are: cost reduction (45.5%), mobility and convenience in accessing applications (44.9%), ubiquity and flexibility of cloud computing (38.9%), need to increase computing capacity (32.9%) and providing greater IT efficiency (31.7%). Hosting services (55.4%), back-up services and hosted emails (41.4%) and data storage (40.1%) were the cloud services most SMEs were interested with that helped reduce on-site IT infrastructure. Cloud computing studies are not well pronounced on the distinction between the impacts that are realizable in relation with the SMEs as opposed to the large organizations. The impacts on SMEs is inherently different from those possible with the large organizations. Cloud computing improves SME's capacity and capabilities without extra expenditures for any expansion of its infrastructure and processing platforms. CC enables SMEs perform at the same level as large enterprises since they are able to access computing resources more flexibly and cost-effectively (Hamburg & Bucksch, 2016).

1.4. Competitive Advantage

Heywood & Kenley (2008) argued that competitiveness is a business-oriented consideration of firm's purposes and successes derivable from the firm's tangible or physical assets, intangible assets, supportive workforce and organizational climate. Competitive advantage can generally be seen to seek to propel an organization to a dominant position occupied by itself or by a few other competitors, strategic groups in a given industry giving such a firm improved market share. Superior production systems, better management of suppliers, greater customer satisfaction and highly improved technology constitute an organization's competitive advantage (Dehning et al., 2003; Liou & Gao, 2011). Business success is majorly anchored on the strategically astute company's flexibility, agility and ability to outrun and outmaneuver its competitors. Competitive advantage encompasses both the traditional sustainable advantage and a more transient leverageable advantage that positions a company on a certain advantaged market positions that

acts as a stepping stone to other privileged positions in future (Carr, 2004).

Michael Porter offered generic strategies, these are; cost, differentiation and focus that can be applied either severally or in combination with any of the other strategies to counter the forces of competition so as to attain and/or sustain the envisaged organizational competitive advantage and improve firm's productivity and profitability (Cua, 2012). El Shenawy et al. (2007) argued that cost leadership and differentiation are the most critical generic discriminators in achieving an organization's competitive advantage. They also portended that competitive advantage can be measured via an organization's financial performance and improved revenues that result due to product quality, customer satisfaction and growth in market share. Based on Resource-based view (RBV) framework one can analyse the competitiveness of an organization via the four competitiveness constructs; valuable, rareness, inimitability, well-organized (VRIO), and non-substitutable resource bundles, thus promotes uniqueness and synergy in the operations of an organization (Liou & Gao, 2011; Lin & Tsai, 2016). However, Rijamampianina et al. (2003) maintains that gained competitive advantage can be eroded over time by an organization's competitors copying its strategies. Purkayastha & Sharma (2016) portends that volatility in IT innovations makes the innovations vulnerable to imitation and hence loss of an organization's competitive advantage. Therefore, organizations should build strong barriers against competitor's behavior likely to cause the erosion of gains through competitive advantage.

Competitive advantage in small firms is different as compared to the large firms, since competitive advantage in SMEs is more concerned with the firm's survival than the firm's above average returns, dominance or even growth in market position. SMEs need to focus on adding value through innovative processes and production so as to achieve better value and customer satisfaction. Competition through value creation is increasingly being based on adherence to standards, professionalism and hence quality (Joanna, Justyna, & Muhamad, 2023). SME's largely operate under very fluid, turbulent and dynamic business environments characterized by high competition and frequently changing customer needs thus necessitating for firm's flexibility, dynamic capabilities and innovative products and services. Such capabilities can be afforded through timely and calculative use of appropriate information and communication technology capabilities (Parida et al., 2016).

ICTs have the potential to develop and maintain competitive advantage by encouraging the organizational learning via knowledge sharing that in turn upshoots organizational innovations and hence unique competences (Adams & Lamont, 2003; Lin & Chen, 2008; Chahal & Bakshi, 2015). Therefore, when organizations adopt the ICTs appropriately they gain Michael porter's strategic benefits; innovations, growth, cost reduction, alliancing and differentiation. Cloud Computing extends the ICTs capability and expands the capacities of the SMEs, lowers their cost of doing business, improve the relationships with customers and sup-

pliers, increase control over marketing and distribution, improves SMEs' return on investments, business performance and provide a real competitive advantage (Sahandi, Alkhalil, & Opara-Martins, 2013; Kasse, Nakawoya, Balunywa, & Nansubuga, 2015).

1.5. Rationale for the Study

ICTs help SMEs create business opportunities and counter pressures of competition by reducing costs, improving internal processes, improving products, innovating promotion and distribution channels, boost the SMEs core business, improve firm performance, better response to client demands and overall productivity. CC's capabilities enable SMEs attain high levels of competitiveness (Neves, Marta, Correia, & Neto, 2011). CC help SMEs to counter high costs and risks associated with the ICTs, it empowers SMEs to develop new capabilities and manage data-intensive activities more efficiently (Sevrani & Bahiti, 2008; Mudge, 2010). We are interested with SMEs for their relevance in the development of world's economies—offering huge employment of labour, skills and technology.

The Cloud's ability to diminish capital costs makes it an attractive ICT to SMEs with limited access to capital and expertise, which makes them more unfortunate and disadvantaged in cases of stiff competition. Cloud can automate SMEs' IT resources to enable them adapt appropriately to changing environment and operating requirements (Sahandi, Alkhalil, & Opara-Martins, 2013). However due to security barriers and lack of information SMEs are reluctant to uptake Cloud services (Hamburg & Bucksch, 2016). Alshamaila, Papagiannidis and Li (2013) portended that very few empirical studies have been conducted on decision making processes on cloud computing implementation. The impact by cloud computing on SMEs has not also been fully studied and understood hence requiring studies to establish the actual benefits and costs of cloud computing (Behrend et al., 2011; Sultan, 2011), moreover, Melville et al. (2004) posited that *“studies on the competitive advantage implications of the technological IT resources are too few in number”*. Therefore, there is need for this kind of study to be able to fully explore the impacts of CC in SMEs and enrich knowledge in this IS field.

This study delves into this emerging information technology, CC, and its power to influence the economic growth, it extensively reviews literature on cloud computing environment, infrastructure and exploring the merits and demerits surrounding CC and its specific influence to the well-being of the SMEs. This study was heavily anchored on the resource-based view (RBV), dynamic capabilities theory (DCT), and some other emergent theories that impact the tangent or loci of organizational decisions through organization's decision processes, these are; innovation configuration, mindfulness and technology destiny. Cloud computing is an emerging and rapidly evolving, complex, context sensitive and all-embracing technology thus its use is majorly influenced by factors within and beyond dominant's technological and organizational factors (Sahandi, Alkhalil, & Opara-Martins, 2013; Alshamaila, Papagiannidis, & Li, 2013).

Therefore, this study focused on the impacts of cloud computing on the SMEs' competitive advantage, it explored a suitable conceptual framework that describes the relationships between the cloud computing capabilities, SMEs' internal factors, business environment and competitive advantage.

2. Literature Review

2.1. The Anatomy of the Cloud

Cloud computing (CC) is an IT platform built in warehouse-size data centers having huge servers capable of rapidly proffering vast scope of application solutions to the users through the Internet (Jaeger, Lin, & Grimes, 2008). It enables “ubiquitous, convenient, on-demand network access to shared pool of configurable computing resources that can be rapidly provisioned and released with minimal management effort or service provider interaction”, and also enabling businesses to get best of technology at extremely economical costs while ensuring business efficiency and agility (Mathur & Verma, 2014). Cloud computing services can be provisioned using the following three key cloud computing models: On-demand services model; clouds automatically provision services when needed to (Ristova et al., 2012; EuroCloud, 2012). Pay-per use model; users are billed on each use of a computer resources, eliminating need to an up-front commitment (Misra & Monda, 2011; Prince, 2011). Utility of the service model; Utility Computing is where the cloud computing vendor provides services on an on-demand basis (Thompson & Van der Walt, 2010; Reis, Fraga, & Gouveia, 2025).

The US-based NIST presents a cloud computing model infrastructure in **Table 1**, composing; cloud's “essential characteristics, three service models and four deployment models” (Ristova et al., 2012).

Table 1. National Institute of Science and Technology (NIST) cloud computing model.

Essential characteristics	Service models	Deployment models
Broad Network Access	Software as a Service (SaaS)	Public
Rapid elasticity	Platform as a Service (PaaS)	Private
Measured service		Hybrid
On-demand/ Self-service	Infrastructure as a Service (IaaS)	Community
Resource pooling		

Source: Ristova, Panov, Gecevska, & Stefanovska (2012).

2.1.1. Essential Characteristics of Cloud Computing

Cloud Computing environment has five major characteristics: self-services, offered on-demand—provides information, tools and functions as services to users when needed: availability of broadband network—cloud technology is provisioned over broadband Internet protocol networks (Dachyar & Prasetya, 2012); measured service and paid-per-use—users pay per every use of the measured services, hence eradicating up-front payments; rapid elasticity and scalability—this is the ability to rapidly respond to users' requests (Maina Lawan, Oduoza, & Buckley, 2021); Resource pooling and virtualization—to provide easy accessibility of

pooled resources via the Internet. Cloud computing technology supports multi-tenancy and security of the ICT resources pooled in warehouse-size data centers that has enabled the establishment and accessibility of large-scale commercial cloud services (Jaeger, Lin, & Grimes, 2008). Pooling of sharable ICT resources results into energy efficiency since data centers improve power utility (Koomey, 2011).

2.1.2. Service Models of Cloud Computing

Service delivery models are the specialized categories of the cloud resources utilized to meet specific needs, the models are (EuroCloud, 2012; Mathur & Verma, 2014; Reis, Fraga, & Gouveia, 2025): Infrastructure as a Service (IaaS)—It proffers clients with the computing infrastructure and support; Platform as a Service (PaaS)—creates an enabling underlying computing programming environment necessary for the institution's proprietary software applications to be developed, loaded and executed on the cloud. Software as a Service (IaaS)—makes software applications accessible from the clients' devices through a thin client interface via the Internet browser.

2.1.3. Deployment Models of Cloud Computing

CC has various forms, there are; private clouds, community clouds, public clouds and hybrid clouds (Reis, Fraga, & Gouveia, 2025). Private Clouds—exclusively applied in a firm for its specific tasks and operated solely for the organization. Community Clouds—Community clouds serve multiple organizations belonging to a community having certain shared common concerns (Prince, 2011). Public Clouds—Public cloud provides services to multiple unrelated clients, are very susceptible to security risks than the others (EuroCloud, 2012). Hybrid clouds—Hybrid cloud encompasses many cloud models integrated together enhancing computer resources movability (Bushhousen, 2011).

2.1.4. Obstacles of Cloud Computing

Cloud computing offers numerous advantages which include: cost control (Koomey, 2011; Reis, Fraga, & Gouveia, 2025), lowers barriers to entry to market (Mudge, 2010; Prince, 2011), device and location independence (Luo, 2012), time to market reduction (Mathur & Verma, 2014), makes SMEs focus on their core business (Kasse, Nakawoya, Balunywa, & Nansubuga, 2015), and ecological footprint reduction and green computing (EuroCloud, 2012). Some of the challenges and obstacles are: lack of interoperability and open standards (EuroCloud, 2012), trust and data privacy and vendor lock-in (Alshamaila, Papagiannidis, & Li, 2013), security (Kasse et al., 2015), reliability, network limitation (Prince, 2011), big data transfer and bottlenecks (Prince, 2011), loss of data control and data recovery difficulties (Mudge, 2010), and legal issues (Reis, Fraga, & Gouveia, 2025).

2.2. The Effects of Cloud Computing Capabilities on SMEs

There isn't a clear criterion for defining the SMEs', different countries define

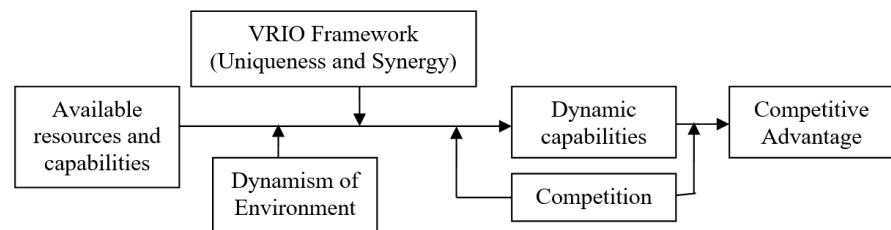
SMEs differently. Commonly used parameters are; firm size, number of employees, balance sheet totals or annual turnover. In Kenya, SMEs are distinguished based on the amount of employees and the annual turnover (GOK, 1999). SMEs are a lifeblood, silent drivers of a nation's economy, making penetration into the new global markets possible and are major source of innovations in the knowledge economy. SMEs use CC to boost their productivity and reducing the costs of production (Sharma, Mehra, Jola, Kumar, Misra, & Tiwari, 2010), hence strengthening their competitiveness given the cloud's affordability, scalability, convenience, ease of management and flexibility (Misra & Monda, 2011; Kasse, Nakawoya, Balunywa, & Nansubuga, 2015).

The SMEs' behavioral and distinctive characteristics affect ICT usage among SMEs. The factors affecting SMEs include; ICT readiness, external customers' and suppliers' pressure, competition forces and government policies, others include; firm structure and size, sector and information intensity, all of which put pressure on the technological and business capacity of SMEs. SMEs should institute information filters to allow firms take advantage of only the positive effects of the available ICTs towards optimization of the business opportunities and thus success of SMEs (Chinyanyu Mpofu & Watkins-Mathys, 2011). Cloud computing improves information and knowledge management, efficiency and dependability of the SMEs, return on investments (ROI), and also simplifies software delivery processes and operations. Cloud computing services proffer SMEs with the opportunities to cope with the rising demand of new ICT technologies at affordable costs (Sultan, 2011). Organizational ICT infrastructure facilities (e.g. equipment, hardware, networks and software) influence performance of SMEs, such that lack of proper infrastructural facilities could lead to excessive capital investments, insufficient support levels and inadequate organizational flexibility (Washington, James, & Peter, 2014). For instance, SMEs are realizing the promised tangible benefits after transiting to cloud technologies, where cloud infrastructure facilities is supporting common organizational applications such as website hosting, file-server, e-mail system, address book and calendar (Neves, Marta, Correia, & Neto, 2011).

2.3. Dynamic Capabilities and Competitive Advantage for SMEs

The resource-based view (RBV) framework posits that competitive advantage of an organization is premised on its resources, unique capabilities and how uniquely the organization resource bundles and competences are blended together (Chukwunonso, Omoju, Ikani, & Ribadu, 2011). Competitive advantage can be defined as the strategic utilization of valuable resources and capabilities of a firm to improve firm's efficiency and effectiveness while exploiting opportunities and diffusing threats in the business environment (Liou & Gao, 2011). Competitive advantage sustains and at the same time keeps improving an SME's healthy performance and market position. SME's competitiveness involves attaining an advantageous position in a market and more so it assures SME's survival

in a highly dynamic and fluid business environment. Competitive advantage is not an instance but rather a process of formulating strategies for the SMEs to be able to exploit numerous sources of firms' competitiveness (Ojeda-Gomez et al., 2007). Competition is such a dynamic phenomenon thus requiring dynamic strategies when allocating and configuring internal resources and also when devising new resources towards obtaining competitive advantage (Lin & Tsai, 2016).



(Source: Lin & Tsai, 2016)

Figure 1. Dynamic capabilities and competitive advantage.

In **Figure 1** dynamic capabilities have a direct positive influence on the organization's performance and competitiveness in a vigorously fluctuating SMEs environment. Adams & Lamont (2003) asserts that IT helps organizations exploit existing internal and external resources and competencies to address changing environments. When organizations face very high competition and their environment keep changing dynamically, it is imperative for such an organization to adopt innovative solutions to aid them to utilize its existing resources. Organizations that adopt VRIO framework; emphasising on valuable, rare, well-organized and inimitable (VRIO) resources do attain uniqueness, synergy, and dynamism in the firm's operations. The VRIO constructs entails: a valuable resource or capability is one that enable organizations to device strategies for efficiency and effectiveness for firms' to exploit opportunities and/or counteract threats; Rare resources or capability is when firms possess a resource/capability not in any many other firms; An inimitable resource or capability is one resulting from firm's unique history conditions, social complexity and casual ambiguity, and; An organization is well-organized when it is ready and able to exploit the firm's capability. Porter argued that to achieve the desired competitive advantage firms need to embrace the new technologies, endeavour to do things differently while optimizing their core competencies (Liou & Gao, 2011).

Organizations can realize the envisaged competitive advantage in their vibrant environment via, among others, two main ways; innovations and strategic flexibility (Lin & Chen, 2008). Innovations in ICT have the capability to influence an organization's business model making the business more competitive, a business model being a tool for proactively designing an organization's offensive business strategy (Purkayastha & Sharma, 2016). Michael porter's value chain analysis tool stressed the role of IT/IS as a value-adding function that supports other strategic activities in the firm (Adams & Lamont, 2003). ICT resource' capability enables sharing of information across different platforms to bolster innovations that exploit business op-

portunities and enable a flexible and responsive business strategy. ICT is being used in SMEs to enhance competitiveness of firms, improve firm's productivity and flexibility. For instance, the government of Malaysia used cloud computing to improve efficiency, reduce costs and eradicate wastages in delivering government services and in their SMEs to boost their performance and consequently reap national economic growth (Chukwunonso, Omoju, Ikani, & Ribadu, 2011).

Pavic, Koh, Simpson & Padmore (2007) assert that the ICT capable firms are currently outperforming competitor firms on profitability and cost reduction. Technology should only be put into optimal use if viewed as an economical medium, can provide a convenient communication configuration and if capable of supporting business organization's strategy impacting company's performance and competitive advantage (Kettinger & Grover, 1997; Moghavvemi, Hakimian, & Tengku Feissal, 2012). Internet enabled businesses coupled with "network capabilities, open international accessibility, innovative entrepreneurship, use of complementary assets" via strategic partnerships and information distribution is increasingly becoming a source of competitiveness in the growing electronic market place (Javalgi et al., 2005). Christensen (2010) asserts that CC is potentially capable of eroding the competitive advantages of their traditional competitors. Cloud computing is promising among many other benefits to reduce SMEs' operational costs and eliminate time-related constraints (Behrend, Wiebe, London, & Johnson, 2011), thus realising organizational competitiveness (Fichman, 2004). It is also revolutionizing businesses by creating Just-In-Time (JIT) systems and facilitating value addition activities through building trading collaborations (Dehning et al., 2003; Melville & Ramirez, 2008). In the section that follows, the study reviewed theoretical framework of CC for competitive advantage, and then looked at the empirical studies supporting cloud computing innovations' usage in SMEs for competitive advantage.

3. Theories of ICT Capabilities and Competitive Advantage

A theory is a system of rules, principles, a conjecture or an opinion providing a structure or a guide for the examination of relationships between variables (Hardaker & Singh, 2011; Alshamaila, Papagiannidis, & Li, 2013). This study relied on more than one interrelated theoretical frameworks as premised on the Melville (2010) advocacy for a multi-theoretical and pluralistic IS research approach. The following are the theories relevant for this study.

3.1. Resource-Based View (RBV) Theory

Resource-based theory creates the understanding of the competitive advantage of an organization. RBV provides theoretical underpinnings for understanding of how resources can be managed strategically. It emphasizes on the unique internal resources of the firm and exploitation of the firm-specific assets and capabilities to achieve entrepreneurial rents and sustainable competitive advantage. The RBV theory suggests that "resources possessed by a firm are the primary determinants

of its performance”. It assumes conceptualization of firms into bundles of resources namely; “firm assets, capabilities, organizational processes, firm attributes, information, reputation and knowledge”, applied in firms to generate strategies towards operational efficiency and effectiveness. RBV depends on both tangible and intangible valuable resources of the organization, applied to achieve the envisaged sustainable competitive advantage (Kitenga & Thuo, 2014; Nayernia, 2026).

According to Ambrosini, Bowman & Collier (2009) RBV operates best in stable environment, the environments that are largely predictable and incrementally undergoing low rate of change. This theory holds that firm’s resources are heterogeneous and are sticky, idiosyncratic and static for a short while due to firms’ inability to develop different competences rapidly even in changing business environments. In that backdrop, the decision process is; firstly, identify the firm’s inimitable resources; secondly, decide the markets that earn the highest rents; and thirdly, “decide whether the rents from those assets are most effectively utilized by (a) integrating into related market(s), (b) selling the relevant intermediate output to related firms, or (c) selling the assets themselves to a firm in related businesses” (Kitenga & Thuo, 2014). The resources are required to be simultaneously rare, valuable, not perfectly mobile, inimitable, non-substitutable and non-tradable without great effort and cost (Barreto, 2010; Damilola et al., 2015).

RBV supports creation of enterprise-wide IT capability from the IT investments. This theory recognizes enterprise-wide IT resource for firm to attain sustainable competitive advantage by integrating; IT infrastructure, human IT skills and IT-enabled intangibles. IT infrastructure encompasses the physical IT assets such as the computer and communication technologies, sharable technical platforms and databases. Human IT infrastructure consists of routines, experiences, competences, commitments, values and norms practiced by the organization’s human resources in delivering the IT products and services, and, lastly, the IT-enabled intangibles are the knowledge management, user orientation and synergy between the stakeholders, among others. RBV can be used in the study of cloud computing and the Service-Oriented Architecture (SOA) which are recent developments in information technology proffering new methods of IT services delivery in businesses and governments (Dahiya & Mathew, 2016; Dash & Pani, 2016).

Resource-Based perspective is often not enough to support a significant competitive advantage (Kitenga & Thuo, 2014), Washington, James and Peter (2014) opined that performance of SMEs is not determined by only the resources it possesses but also by how it manages and utilizes those resources to attain organizational performance objectives. Although RBV is an influential theory, it is alleged to be vague, redundant and having a limited focus incapable of explaining how resources impact competitive advantage (Nayernia, 2026). It is also viewed as static and equilibrium-based model while as the external firm’s environment is ever more turbulent and hypercompetitive. Dynamic Capability Theory (DCT) is

a more integrative approach that complements RBV (Easterby-Smith, Lyles, & Peteraf, 2009; Nayernia, 2026).

3.2. Dynamic Capability Theory (DCT)

Dynamic capability theory is an extension of Barney's RBV, it complements it and addresses RBV's shortcomings for superior performance and firm competitiveness in a dynamically turbulent environment (Ambrosini, Bowman, & Collier, 2009). A dynamic capability identifies opportunities and threats, directing timely and market-oriented decisions towards renewed resource base (Barreto, 2010). Teece, Pisano and Shuen (1997) defined dynamic capability as "the capacity of an organization to purposefully create, extend, or modify its resource base" to be more responsive to the dynamically changing technological and business environments (Easterby-Smith, Lyles, & Peteraf, 2009; Ambrosini, Bowman, & Collier, 2009).

Dynamic capabilities connote an organization's fast, innovative and flexible strategies through its processes/routines, organizational positions, path dependencies and organizational capacities. Dynamic capabilities (DC) namely; values, culture, firm behaviour and firm experience are built and not bought, hence distinctive competences and capabilities built within a firm are hard to replicate (Barreto, 2010; Nayernia, 2026).

DCT takes into consideration the micro perspective which stresses the manager's perception as to what the firm's environment (both internal and external) and resource base are. It is the purposefully applied, managerial perceptions of the desire to change (Ambrosini, Bowman, & Collier, 2009). It enables sensing and shaping market opportunities, seizing market opportunities and redeploying and reconfiguring the resource base, and thus it is now a dominant paradigm for the explanation of competitive advantage. DCT suggests two types of capabilities: Ordinary capabilities to be able to operate their chosen lines of business efficiently and effectively, and dynamic capabilities which upgrades and reconfigures the ordinary capabilities towards creation of new capabilities. Dynamic capabilities rely on the innovation-based competition, price/performance rivalry, and creative destruction of existing resources and novel recombination into new operational capabilities to ensure firm's distinctive competences (Nayernia, 2026).

Dynamic capability takes a variety of forms involving different functions, such as marketing, product development or process development, that transforms organizational processes, operations and allocations of resources (such as human capital, technological capital, knowledge-based capital, and tangible-asset-based capital) (Easterby-Smith, Lyles, & Peteraf, 2009). Dynamic capability framework has three sets of variables: Dynamic capability variables as regenerative capabilities, namely; "reconfiguration, leveraging, learning and renewing capabilities" using factors such as sensing, seizing and reconfiguration. Reconfiguration enables transforming and recombining assets and resources, leveraging entails replication or extending the usage of a process, system or a resource from one firm location

to another and integration of resources (Teece, 2007; Nayernia, 2026).

Ambrosini, Bowman & Collier (2009) alluded to the four categories of firm capabilities, namely; the resource base itself, modification of the resource base, the creation or extension of the resource base, and lastly, the meta-capabilities (the learning-to-learn capabilities that renews the extant capabilities ad infinitum). The meta-capabilities respond innovatively (creating alternative, new capabilities) to the changes in the environment or in the firm's position. The four capabilities may be further classified into three distinct levels of dynamic capabilities: firstly, incremental dynamic capabilities: deliberate incessant improvement of the firm's resource base; secondly, renewing dynamic capabilities that refresh, adapt and augment the extant resource base by creating, extending or modifying the resource base; thirdly, regenerative dynamic capabilities, these influence both the firm's resource base and the firm's existing dynamic capabilities. Regenerating capabilities act upon the extant non-effective dynamic capabilities to renew them to be able to provide the much expected rent levels and competitive advantage in turbulently changing environments where the external change is volatile, non-linear and discontinuous. Generative dynamic capabilities can be outsourced as a one-off performance but when they pass the experimental and repeatability test they then qualify for long term embeddedness. Dynamic capabilities are created and evolve through the repeated and learning mechanisms, noteworthy, dynamic capability is both path and learning dependent where learning guides the genesis and evolution processes, other mechanisms relevant to the new ventures include: trial and error, improvisation and imitation.

Nevertheless, Fichman (2004) advanced a believe that the link between the ICT capabilities and the organizational performance and competitive advantage can be explained by some theories that do show the role that incredible moderating factors play in catapulting the optimal enjoyment of the ICT benefits, such theories are; innovation mindfulness, innovation configurations and technology destiny. These theories explicate the role of careful ICT investments and implementation towards the achievement of the quality innovations and the envisaged performance impacts.

3.3. Innovation Configuration Theory

Innovation Configuration is the process of translating an innovation into a product or service in a manner that creates value, this allies to innovations that are easily replicated in an economical manner whilst satisfying particular intended business needs. Therefore, innovation configuration connotes careful holistic combination of favorable factors that together are capable of producing the anticipated organizational performance impacts, which ultimately determine either the success or failure of an organization (Fichman, 2004).

3.4. Technology Destiny Theory

Technology destiny helps determining whether innovations are technically bene-

ficial, efficient, and economical and also it entails trying to determine the sustainability of such organizational benefits. Therefore, an organization tests an innovation against its overall business objective so as to determine a good fit and ensure that when an innovation is implemented it is beneficial and minimizes any organizational disadvantages. However, it is still possible to find innovations with poor destinies being implemented where such innovations are underrated or misunderstood and in other cases managers may deliberately continue to implement innovations knowing their destiny is poor, especially when; existing project manager is the originator of the innovation, the project manager has very high risk propensity levels, project manager holds lopsided information about the project status, and when projects' perceived sunk costs are high (Fichman, 2004).

3.5. Innovation Mindfulness Theory

Innovation mindfulness proffers a bridge between the dominant theories and sociological theories of adoption (Melville & Ramirez, 2008). Innovation mindfulness is where an organization makes thorough judgements grounded on its own facts, specifications, unique circumstances and conditions to proactively evaluate and select feasible and implementable innovations out of all the possible innovations. Mindfulness connotes watchfulness, keenness and vigilance of mind which can be evinced by; openness to novelty, alertness to distinction and continuous inventions, openness to new information for sensual sensitivity to different context, an implicit awareness of multiple perspectives, and orientation in both the present and future (Fiol & O'Connor, 2003; Lei, 2016). Risks associated with the mindlessness of IT innovators tend to escalate as the firms' involvedness and investments into the IT innovations upturns, ultimately forcing the firm to be mindful to survive (Swanson & Ramiller, 2004; Oredo & Njihia, 2015).

4. Empirical Literature

4.1. SMES, ICT Capability and Competitive Advantage

Melville, Kraemer and Gurbaxani (2004) argued that ICTs have the potential to cause business flexibility, cost reduction, productivity and quality improvement that lead to business competitive advantages. Hamburg & Bucksch (2016) argued that use of the emerging ICTs ilk cloud computing proffer SMEs myriad of opportunities to improve their business and grant them efficient and economical access to technology making them competitive amidst business environment turbulences. Sev-rani & Bahiti (2008) postulate that with the rise in the number of SMEs, pressure of competition upsurges to cause reduction in commodity prices and may diminish the SME's market share. Therefore, ICTs avail SMEs with opportunities for improved firm performance and reduced costs due to improved internal processes, innovative and improved production, faster cum cheaper communication with business customers and suppliers and lastly, ability to market or promote products and services via online means. Mohapatra (2012) did a study on the ICT and Porters' competitive forces and found out that ICTs have revolutionized how competi-

tive forces influence organizations by changing the characteristics of business models to cause the expected competitive edge and business success.

4.2. Cloud Computing (CC) and SMEs Capability

Sultan (2011) noted that the flexibility, pay-as-you-go costing strategy and scalability of computing services make cloud computing a viable ICT technology. Sahandi, Alkhalil, & Opara-Martins (2013) in their study of the CC from SMEs perspective posited that CC is potentially capable of addressing operational inefficiencies and enable SMEs access the state-of-the-art technologies in a dynamic and cost-effective manner thus fallout to the growth and competitiveness of the SMEs. Martin (2011) in their study on development of SMEs through ICT, opined that ICTs influence the performance of SMEs by; reducing operation costs, improve management capability and productivity through innovation and research. Ristova, Panov, Gecevska, and Stefanovska (2012) carried out a study of the business perspective of CC for SMEs and portended that SMEs that embrace CC save up to 50% on capital outlays and are also able to focus more on their core competency. This view was supported by Neves, Marta, Correia and Neto (2011), observing that CC allows organizational time to be expended on core competences. Mathur & Verma (2014) researched on the significance of DOI model for adoption of Cloud Computing and posited that cloud computing is a serious innovation for medium organizations because of its capital expenditure impacts and also as a dynamic tool enhancing business productivity.

4.3. Cloud Computing Impacts on SMEs

Lei (2016) asserts that the emerging ICT innovations (e.g. cloud computing) in the dynamically changing business environments is being influenced by “organizational learning, social contagion, management fashion, organizing vision and computerization movement” as a result of the emerging multi-dimensional networks of complex social environments. Melville, Kraemer & Gurbaxani (2004) in their study of ICT and organizational performance they evinced the impacts of both the external and internal environments on innovation and business performance, they argued that industry and government policy regulations, cultural and structural factors and rapid technology changes may promote or discourage innovative culture. Dahiya & Mathew (2016) in their study of the “IT assets, IT infrastructure performance and IT capability” held that resource-based view theory is applicable cloud computing and Service-Oriented Architecture (SOA) studies.

Table 2. Empirical studies involving adoption models in cloud computing.

Study	Purpose of the Study	Theories applied	Main Findings	Gap
Hazen & Byrd (2012)	Creating competitive advantage with logistics information technology (LIT)	RBV and Resource Advantage Theory	Logistics Information Technology promotes enhanced levels of effectiveness, efficiency and resiliency for the firm	- Resource complementarity for competitive advantage - Updated LIT

Continued

Chaharbaghi & Lynch (1999)	Sustainable competitive advantage: towards a dynamic resource-based strategy	Resource-Base view (RBV)	Problem of infrastructure which plagues organisations cannot be resolved effectively without a dynamic resource-based strategy	With the acceleration of competition, there is need to view competitiveness with a new paradigm other than the prevailing narrow approach of optimisation
Washington, James & Peter (2014)	The Effect of Business Development Services (BDS) on Performance of SMEs Manufacturing Enterprises in Kenya	- Resource-Base view and - Resource-Dependent theory	Procurement services and infrastructure facilities showed a positive influence on performance of small and medium manufacturing enterprises in Kenya	Further studies to focus on manufacturing firms beyond Nairobi and service sector SMEs, investigating how firm characteristics and managerial competency impact SMEs' performance
Ambrosini, Bowman & Collier (2009)	Dynamic capabilities and their useful constructs in strategic management	RBV and Dynamic Capability Theory	The dynamic capabilities field has advanced considerably in the decade since Teece et al.'s (1997) original contribution	Integrate DCT into other fields e.g. innovation, knowledge management, organizational change and development and organizational learning
Zaidi & Othman (2011)	Understanding Dynamic Capability as an On-going Concept for Studying Technological Capability	Dynamic Capability Theory and RBV	Technological management and technological capability is have an important role in deciding the firm success	Technological capabilities from the concept of Dynamic Capabilities
Sultan (2011)	Reaching for The Cloud: How SMEs can Manage	Case study	CC is an attractive technology for SMEs due to its flexible cost structure and scalability and thus a cutting edge technology helping retain and attract clients	A more exhaustive study covering more CC platforms from diverse vendors to help examine benefits, pros and cons of cloud computing to SMEs.
Bharadwaj, A. S. (2000)	Resource-based perspective on information technology capability and firm performance	Resource-Based View	Firma with high IT capability tend to outperform those firms lagging behind, and they are enjoying great benefits such as cost-effectiveness	- Carrying out a longitudinal study - A search to identify more important IT resources to help determine what can cause superior firm performance
Bharadwaj, A. S., Bharadwaj, S. & Konsynski, B. (1999)	The Moderator Role of Information Technology in Firm Performance: A Conceptual Model and Research Propositions	- Contingency approach - Resource-based view - Case study	New conceptualization of information technology's impact on firm performance, namely the moderator role of IT	Identify the most important factors enhanced by IT initiatives that influence firm business performance
Oredo & Njihia (2014)	Challenges of Cloud Computing in Business: Towards New Organizational Competencies	Resource-based theory	Resource-based view of the organization used to ground and support the need for new competencies for cloud implementation	Empirical research to validate the new competency development processes for maximum utilization of the cloud
Melville, Kraemer & Gurbaxani (2004)	Information Technology and organizational performance: An integrative model of IT business value	Resource-based view	IT is value encompasses benefits ranging from flexibility, quality improvement, cost reduction and productivity enhancement	Empirical studies assessing the degree of IT resource imitability using Integrative Model of IT Business for Sustainable competitive advantage

Continued

Marino et al. (2015)	Driving Performance via Exploration in Changing Environments: Evidence from Formula One Racing	<ul style="list-style-type: none"> - Systems Theory - Systems integrated capabilities 	Impaired capabilities to integrate the new capabilities into the system's architecture design inhibits the otherwise positive relationship between firm exploration and firm performance	<ul style="list-style-type: none"> -Expand the findings to other industries and dimensions of environmental change -empirical research designs to operationalize and test the suggested mediators and associations in this study. -Future research that elaborate on the framework of the relationship between mindfulness and decision-making processes in organizations. -Test whether processes described in this study lead to mindfulness in decision making
Fiol and O'Connor, (2003)	Waking up! Mindfulness in the face of Bandwagons	<ul style="list-style-type: none"> Rational-efficiency theories Economic and Social cognitive theories 	Benefits of mindfulness include; expanded scanning and context-relevant interpretation of internal and external conditions	

4.4. Summary/Gap in Literature

Though literature, theoretical and empirical studies in **Table 2** have provided insightful findings about the diverse ways ICT influences performance of the SMEs towards a sustained competitive advantage, there is insufficient research focusing on the cloud computing innovations and thus inadequate to unearth the causal relationship between the cloud computing capabilities and competitive advantage in SMEs. **Dash and Pani (2016)** asserted that cloud computing's Service-Oriented Architecture (SOA) proffer new methods of IT services delivery in businesses, **Oredo & Njihia (2014)** alluded to the new competency development processes for maximum utilization of the cloud, while **Sultan (2011)** suggested future studies to be carried out covering various cloud platforms by diverse vendors to help examine benefits and business rents from cloud computing investments to SMEs. This study established a conceptual model putting together; cloud computing capabilities, SME's characteristics, business environment, management decision making processes and the firm's performance and competitiveness.

5. Conceptual Framework

Following the theoretical and empirical review, the study's conceptual framework assumed the model structure in **Figure 2**. Firstly, it entails cloud computing capabilities which are; "reduction of cost, improved productivity improvement, improvement of internal processes, market growth, innovativeness", advancement of SMEs' core competences and capabilities. Secondly, the framework evinced the SME internal features that encompass; Size & scope, organizational structure, social networks & contagion, management fashion, top management support, technology competence, ICT readiness, financial strength and number of staff. Thirdly, it includes the business environment;

industry policies, government regulations and politics, technological change and internal organizational change. Fourthly, the framework showed the role played by the intervening variables to facilitate and smoothen the adoption of the cloud computing technologies in SMEs, these include management decision processes such as innovation configuration, innovation mindfulness and technology destiny. Lastly, the adopted cloud computing results into the desired competitive advantage for the SMEs as proved by the improved markets, improved return on investments, and overall business efficiency and effectiveness.

5.1. Operationalizing Variables

5.1.1. Cloud Computing (CC) Capabilities, Dependent Variable

Cloud Computing provides the required knowledge (software) and infrastructure (hardware) that is capable of improving production processes, boosting SME's economic efficiency, productivity growth, cost reduction, innovativeness, improved internal processes, ability to market or promote products and services thus improving return on investments, market share of SMEs and overall quality improvement that lead to SMEs' competitive advantages (Melville, Kraemer, & Gurbaxani, 2004; Olise, Anigbogu, Edoko, & Okoli, 2014). Cloud computing is a new disruptive information technology paradigm (Oredo & Njihia, 2015) that has the potential to build dynamic capabilities to enhance organizational performance and hence achievement of envisaged competitive advantage even in turbulent environments (Pavlou et al., 2004; Street & Denford, 2012).

CC reduces the need for hefty SMEs' start-up capital and start-up times hence leading to a quicker time to the market. Cloud Computing offers numerous advantages which include cost control, lowers barriers to entry to market, device and location independence, time to market reduction, allows the client company to concentrate their efforts on the strategic core business activities (EuroCloud, 2012; Kasse, Nakawoya, Balunywa, & Nansubuga, 2015), reduces the solution cycle development improving responsiveness to business change while ensuring greater agility in service innovation (Mathur & Verma, 2014). It addresses operational inefficiencies and enable SMEs access the state-of-the-art technologies in a dynamic and cost-effective manner thus fallout to the growth and competitiveness of the SMEs (Sahandi, Alkhalil, & Opara-Martins, 2013). SME's characteristics and business environment proffer enabling environment to cloud computing for optimal benefits to the SMEs and hence ensuring SMEs competitive advantage. Cloud computing essential characteristics and services; on-demand self-service, broadband network access, resources pooling, rapid elasticity and scalability, and measured services and utility, have been used in this study to conceptualize the benefits derived from the cloud computing technologies.

5.1.2. Business Environment

Melville, Kraemer and Gurbaxani (2004) posits that both the external and internal environments influence innovation and business performance, they argued that

industry and government policy regulations, cultural and structural factors and rapid technological changes are some of the environmental considerations that are capable of either promoting or discouraging innovative culture and hence favorable business performance. Other environmental indicators encompass technological change in the industry, competitors' activities, changing consumer demands and product lifecycle (Teece, 2007). SME's largely operate under very fluid, turbulent and dynamic business environments characterized by high competition and frequently changing customer needs thus necessitating for firm's flexibility, dynamic capabilities and innovative products and services. Such capabilities can be afforded through timely and calculative use of appropriate information and communication technology capabilities (Parida et al., 2016). SME's competitiveness involves attaining an advantageous position in a market to assure them of survival in such highly dynamic and fluid business environment (Ojeda-Gomez et al., 2007). In case of the business environmental changes the SMEs feel the impact more than the larger enterprises due to the SMEs limited resources, inflexibility and inability to obtain the required expertise as and when needed (Fichman, 2004; Hamburg & Bucksch, 2016).

5.1.3. Characteristics of SMEs

SMEs with certain favorable profile, necessary features or characteristics are able to adopt and implement relevant innovations. SMEs characteristics entail; Size & scope, organizational structure, social networks & contagion, management fashion, top management support, technology competence, ICT readiness, financial strength and number of employees (Chinyanyu Mpofu & Watkins-Mathys, 2011; Alshamaila, Papagiannidis, & Li, 2013). Most of the SMEs' characteristics are viewed and grouped under "quantity of innovation" factors as guided by the Technology Adoption Model (TAM). Quantity of innovation increases with the increase in traditional innovation antecedents and there exists a positive correlation between the quantity of innovation firm characteristics and firm performance since the upsurge in the innovations adoption and usage improve business performance (Bradley, 2012).

5.1.4. The Management Decision Process, Intervening Variables

Fichman (2004) portended that linkages, interventions and mediators between the independent and the dependent variables are necessary. This study used the management decision process as the intervening variable to help determine essential technological innovations that best help SMEs achieve their organizational objectives and hence competitive advantage. management decision process included the; innovation configuration, technology destiny and innovation mindfulness. management decision process is achieved when cloud computing capabilities are enhanced by favourable SMEs' characteristics and supported favourable business environment. It is modelled as an intervening variable between the cloud computing and competitive advantage of SMEs.

1. Innovation Configuration

Innovation configuration is a careful holistic integration of suitable salient constructs with an organizational goal of attaining the intended performance levels and favorable impacts. Therefore, it entails proper alignment of the demands of the organizational tasks to the capabilities of the technology so as to attain the expected performance benefits, an advancement of the IT-Business strategy alignment (Fichman, 2004; Pavlou et al., 2004; Bradley, 2012).

2. Technology Destiny

Technology destiny helps determining whether innovations are technically beneficial, efficient, and economical and the sustainability of such benefits. It is measured by; the proportion of the target population that ultimately adopt and institutionalizes the innovation, the cumulative expenditure incurred on the innovation, or the aggregate net economic benefits from the innovation (Fichman, 2004).

3. Innovation Mindfulness

Innovation mindfulness in this study takes the role of a mediator between the independent antecedents and the dependent variables (Melville & Ramirez, 2008). Mindfulness helps managers make discriminatory choices when determining whether, when and how to innovate with IT, thus repulsing mindlessness of band-wagons. The characteristics of an organizational mindfulness are; greater disinclination to simplify, greater commitment to resilience, greater preoccupation with both success and failure, attention to operations, and migration of decision to expertise, especially where decision structures are highly underspecified (Swanson & Ramiller, 2004; Oredo & Njihia, 2015). The five facets promote continuous organizational scanning, interpretation and informed decision making processes for greater perceptual accuracy and reliability in the face of rapidly changing environment (Fiol & O'Connor, 2003; Fichman, 2004).

5.1.5. SMEs Competitive Advantage, Dependent Variable

Melville et al. (2004) portended a positive correlation between investment in IT innovations and organizational performance, spanning into cost reduction, productivity, operational efficiency, sustainable competitive advantage and other IT capabilities. Investments in ICT can produce net efficiency benefits evidenced by the net business value and return on investment (ROI) due to the cost reductions and improved productivity, thus ICT becomes an indispensable tool for creating and sustaining firm's growth and competitiveness (Zhang et al., 2007; Baker, 2012; Mohapatra, 2012). Effectiveness leads to the attainment of the organizational goals and a competitive advantage where a firm is able to properly align ICT strategies with business strategies, considering the prevailing organizational internal and external conditions (Reinking, 2012). This research delves to establish cloud computing ability to build dynamic capabilities to enhance organizational prosperity and survival towards achievement of its envisaged competitive advantage even in turbulent environments (Pavlou et al., 2004; Street & Denford, 2012).

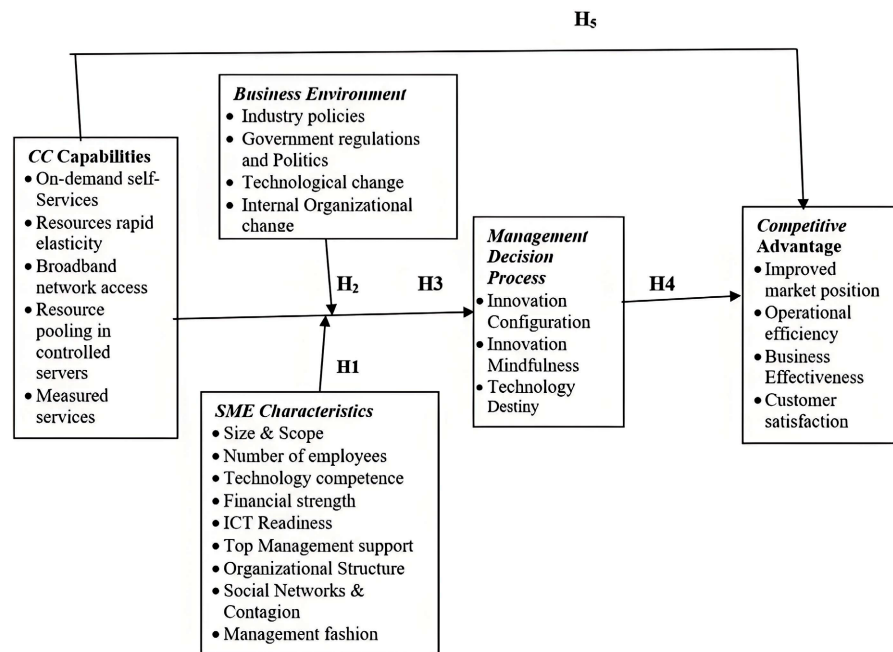


Figure 2. Conceptual model of cloud computing for competitive advantage.

6. Review Method

The main information source for this study was the google scholar. Electronic search was conducted across the peer-reviewed articles, followed by the ancestry searching for supplementary information by scanning the articles reference lists. The search strategy applied was search strings and keywords, through systematic reviews and the empirical studies. The study did not use unpublished conference and non-reviewed articles.

The literature review selection process was; identification of review resources, confirmation of the relevance of the resources to this study, and detailed assessment of the content in the articles. Data synthesis, grouping of the review resources and findings collection was done using the key study themes and variables. Finally, author's information, publication year and key findings of the articles and journals were extracted and recorded and organized to form this study.

7. Conclusion

Cloud computing proffers technology users a growing collection of computing resources that minimize capital expenditure for start-up businesses (Mathur & Verma, 2014). This study delved into the concept of cloud computing and how it can influence competitiveness of SME businesses in the prevailing turbulent and dynamic business and technological environments. The study culminated with a conceptual framework that encompasses Cloud computing capabilities, SMEs' characteristics, business environment, management decision processes and SMEs' competitive advantage. This conceptual model has extended IS research variables to include moderating variable between cloud computing and the management decision making interventions, and the study opined that management decision

making has the capability to influence organizational competitiveness. This study may also inform the cloud computing users on the salient technology constructs, envisaged benefits and the challenges associated with cloud computing. Moreover, hardly enough empirical research has been conducted on decision-making processes in the cloud computing context. Nevertheless, studies on cloud computing innovations and its impacts on competitive advantage are either too absent or too few, therefore, justifying the need for more studies that explores the impacts of cloud computing to the SMEs (Behrend et al., 2011; Alshamaila, Papagiannidis, & Li, 2013).

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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