TECHNOLOGICAL, ORGANIZATIONAL AND ENVIRONMENTAL FACTORS ON THE ADOPTION OF CLOUD COMPUTING IN INSURANCE INDUSTRIES IN KENYA: A CASE STUDY OF UAP-OLD MUTUAL, NAIROBI, KENYA

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ABSTRACT

The main objective of this study was to find out how the technological, organizational and environmental factors affect the adoption of cloud computing services within insurance industries in Kenya with a case study of UAP-Old mutual. The study was anchored on Technological, Organizational and Environmental model; technology acceptance model and Innovation Diffusion theory in its argument. The study used descriptive research design and adopted the stratified random technique. The target population consisted of 483 employees at the headquarters in Nairobi out of which a sample of 215 was picked. This study used questionnaires with closed questions to extract responses from members of the sample population. Data collected was purely quantitative and it was analyzed with the aid of SPSS V23 and presented on tables, figures and charts. Additionally, the study used a multiple regression analysis for the purpose of analysing the relationship between the study variables. From results, Technological factors, Organizational factors and Environmental factors all have a significant relationship with the adoption of cloud computing at 5% level of significance and 95% level of confidence. However based on the explanatory power of coefficient of determination the independent variables organizational factors had the highest explanatory power of 0.675 or 67.5%, P<0.05, thus being the most significant Variable; Environmental Factors had 0.575 or 57.5%, P<0.05 while Technological factors were the least significant with 0.527 or 52.7%, P<0.05). This showed that all the variables have significantly relationship with the dependent variable (adoption of Cloud Computing). The study also found that Technological factors affected the adoption of Cloud Computing at UAP-Old mutual; Organizational Factors had a positive influence on the adoption of Cloud computing at UAP-Old mutual; Further it was evident that Environmental factors have a significant influence on adoption to cloud computing at UAP-Old mutual. This showed that all the variables have a significant relationship with the dependent variable (Adoption of Cloud Computing). The study further recommended that to be able to develop new ideas, employees must have enough knowledge about the field they operate in to move it forward. To support this, a work environment that is tolerant and welcomes new ideas.

Key Words: Technological, Organizational, Environmental, Cloud Computing

INTRODUCTION

Many countries around the world remain underinsured. Sen, (2016) estimates that the mortality protection gap in the Asia Pacific region amounts to US$58 trillion, while the shortfall in non-life insurance premiums from a sample of 42 countries exceeded US$150 billion. With cloud computing as a base for scaling innovation in insurance technology with advanced disruptive technologies like the internet of things (IOT) which has the potential of significantly improving risk pricing, which lies at the core of every insurance business (Sen, 2011). Connected devices like connected homes, wearable devices, smart meters can generate lots of data which results in a more accurate risk assessment of different policyholders. Insurance companies that adopted cloud computing will automatically increase data availability and enhance targeted risk assessment which will make them easier to have products for the different market segments as per the risk assessment hence lead to profitable options.

The insurance regulatory of Kenya reported on the insurance industry outlook for 2017. The report showed how Kenya insurance industry remained resilient even after the prolonged electioneering period with growth of 6.3% increase in premiums, which is an increase of KES 196.64 billion in 2016 to KES 209 billion in 2017. These show how the market is still untapped, and through the use of cloud computing as the base for disruptive technologies, the market may grow adversely (IRA, 2017). Cloud computing adoption has been increasing immensely worldwide. A case example of India. Cloud computing adoption in India increased from 1.3 billion dollars in 2016 to reach 1.8 billion dollars in 2017 which Gartner projected it to be a 38% year to year growth and stated that the market would heat 4.1 billion dollars by 2020. Gupta, (2018) The analysis showed how infrastructure as service is leading in India's cloud market growth closely followed software as a service and cloud management. They will be at 2028 billion dollars, 1006 billion dollars, and 281 billion dollars respectively. The significant drivers to cloud computing adoptions in India are minimal or no upfront ICT investments, performance agility due to improved machine learning and artificial intelligence which use cloud systems like processing power, pay-as-you need, and pay-as-you-go and finally device location independence (Gupta, 2018)

UAP Holdings Limited is the pan-African Financial Services Company with a primary purpose of acting as a holding company for the various UAP businesses. The Group’s origins in Kenya date back to the 1920's when Provincial Insurance Company of East Africa was incorporated. UAP Insurance Company Limited was formed in 1994 after the merger of Union Insurance and Provincial Insurance following the merger of their respective parent companies - Union of France and Provincial of the UK. In 1996 UAP Insurance Kenya became part of AXA after the Paris-based firm acquired UAP in France. AXA divested in 2000 and UAP Group became a fully-owned Kenyan company. UAP Group embarked on a multi-phased restructuring plan in 2006 to shift from a traditional non-life insurance business to a broad-based Insurance and Financial Services Group. UAP Group has grown into a Pan-African Financial Services Group with a geographical footprint in six (6) countries namely Kenya, Uganda, South Sudan, Rwanda, Tanzania and Democratic Republic of Congo (DRC). The range of services and products have grown beyond General Insurance to include Life Assurance, Property Investments, Fund Management and related Financial Services such as insurance premium financing, financial advisory and securities brokerage.

Old Mutual Kenya is a wholly owned subsidiary of Old Mutual plc, an international financial services company, with expanding operations in life assurance, asset management, banking, and general insurance. Old Mutual is an FTSE 100 company in the financial sector and ranks as a Fortune Global 500
company. Old Mutual started in Kenya in the late 1920s and was directed from Salisbury until 1930 when a branch was established in Nairobi.

In 2014 Old Mutual acquired a controlling 67 percent interest in Faulu Kenya, the second-largest microfinance bank in Kenya, whose stock is privately held, for a sum of KSh3.6 billion (approx. US$40 million). In early 2015, Old Mutual, spent a total of US$253.1 million (KSh 23.1 billion) to acquire 60.66 percent shareholding in UAP Holdings. Later in 2015, Old Mutual began to consolidate all its investments in Kenya under one company, namely the “UAP Old Mutual Group. Old Mutual Kenya bough UAP insurance in 2016 under the umbrella UAP-Old Mutual. This saw their profits fell to 32.4 % before tax, which resulted in a massive layout of 89 personnel in the year of 2018.

Statement of the problem
Alkhater, Wills, and Walters, (2014) Observes that cloud computing is a paradigm that has emerged to deliver IT services to consumers as a utility service over the Internet. In developing countries, particularly Saudi Arabia, cloud computing is still not widely adopted. Chandrashekhar and Shashikumar, (2017) provide the factors that led to organization adoption to cloud computing as on-demand service, pay-per-use or Pay-as-u-go, reliability, cost-efficient, quick deployment, no long term commitments, and no software and hardware installations. Alzahrani, (2016) States that cloud computing and big data is a significant entity in the industry of information technology these days. He equates it to the internet and the web that took the world by storm in the 1990s and early 2000s. Cloud evolution was accelerated in 1999 through provision of agile enterprise level applications to the customers.

UAP-Old mutual insurance has had some challenges for not embracing cloud computing, either be it hybrid or fully cloud. The company has been faced with inadequacies of agility in that scalability within the ICT infrastructure of the company is limited. Deployment of products that can counter competition takes a longer than expected time since the organization has not embraced cloud computing as a way of deploying products faster to the customer. Inadequacy of systems facing customers that customers interact with daily 24/7, and 365 days have an issue of down times. System downtimes have eroded customer confidence in getting better quality, faster service. UAP-Old mutual has various challenges such as refusal to honor legitimate claims, mergers and acquisitions challenges, and increased horizontal and vertical competition from the 44 licensed insurance companies (Nalwenge and Koech, 2018)

Failure to embrace cloud computing into the organization strategy has made the company profits to sink deeper due to inability to implement destructive technologies, for example, Artificial intelligence which has to predict the pattern of the claim and reduces fraud. Big data analytics which helps the company forecast on potential customers and internet of things (IOT) which can help mitigate fraud. UAP-Old mutual total comprehensive incomes have been on a worrying trend; in 2012 they posted a comprehensive income of Ksh 2,116,931; 3,41,356 in 2013; 2,795,812 in 2014; 956,627 in 2015; (100,991) in 2016; 137,449 in 2017 and (419,771) in 2018. The inconsistency in the firms financial performance was attributed by the management to increase in customers claims a factor that can be easily managed by adoption of cloud computing (Old Mutual-UAP, 2019)

Nevertheless, through a change of ICT strategy and align the business to cloud computing, it enables the business to collaborate easily than having tradition methods, improve performance, and uptime on customer-facing application. Cloud artificial intelligence (AI) may increase the voice of the customer by automating customer interaction and a cheaper cost than employing a number call center
agents hence reduce cost. Having cloud-based AI apps are so advanced that they can quickly discover important information and relevant findings while processing big data.

The merger of old mutual and UAP insurance brought lots of organization politics and lack of top management support to steer innovation. Many top talented employees, both within the ICT and products department left during the merger period. Lack of proper strategic direction and ploy strategies has made the organization not to champion the ICT department as a business lead hence making it very difficult to develop a cutting edge solution to customers faster and at a cheaper rate. This study therefore sought to investigate the influence of technological, organizational and environmental factors on the adoption of cloud computing in the insurance industries in Kenya, a case study of UAP-Old mutual Nairobi Kenya.

**Objectives of the Study**

The main objective of the research study was to investigate the influence of technological, organizational and environmental factors on the adoption of cloud computing in the insurance industry in Kenya a survey of UAP-Old mutual Nairobi Kenya. The specific objectives were;

- To ascertain influence of technological factors on the adoption of cloud computing
- To examine influence of organizational factors on the adoption of cloud computing
- To assess influence of environmental factors on the adoption of cloud computing

**LITERATURE REVIEW**

**Technology, Organization and Environment Model (TOE)**

This theory has been utilised in this study to collaborate the Adoption of cloud Computing and Technological, organizational and Environmental factors. According to (Tornatzky and Fleischer, 1990) the original technology–organization–environment (TOE) model was developed for the adoption of innovations. Awa and Liu, (2016) Stated that TOE is a model that proposes three bits of organizational context that affects or influence implementation or adoption of innovations. The technological context implies to the pool of technologies which are internal or external to an organization about their perceived usefulness, compatibility, pilot test, and complexity in the learning curve.

**Technology Acceptance Model (TAM)**

The TAM collaborates the Adoption of cloud Computing, Technological and Organizational Environmental factors in this research study and thus it’s the anchoring theory of the study. According to (Davis et al., 1989) the theory applies to any specific domain of human–computer interactions The TAM asserts that two salient beliefs PU and PEU determine technology acceptance and are the key antecedents of behavioral intentions to use information technology. The first belief, PU was the degree to which an individual believes that a particular system would enhance job performance within an organizational context (Davis et al., 1989). PEU, the second key belief, was the degree to which an individual believes that using a particular system would be free of effort (Davis et al., 1989). In addition, the model indicated that system usage was indirectly affected by both PEU and PU.

**Innovation Diffusion Theory**

Innovation Diffusion Theory (IDT) has been utilised in this study to try and explain the Adoption of cloud Computing and organizational factors. The Diffusion of Innovation Theory was first discussed historically in 1903 by the French sociologist Gabriel Tarde (Toews, 2003) who plotted the original S-shaped diffusion curve, followed by (Ryan and Gross 1943) who introduced the adopter categories that were later used in the current theory popularized by Everett Rogers. It was then introduced in 1962, the Innovation Diffusion Theory was fine-tuned by (Rogers 1995). Innovation diffusion theory focuses on
understanding how, why and at what rate innovative ideas and technologies spread in a social system (Rogers, 1962). In terms of the theories of change, Innovation Diffusion theory takes a contrary approach to study changes. Instead of focusing on persuading individuals to change, it sees change as being primarily about the evolution or “reinvention” of products and behaviours so they become better fits for the needs of individuals and groups. In diffusion of innovations, it is not people who change, but the innovations themselves (Les Robinson, 2009). On the other hand, diffusion is the process by which an innovation is communicated through certain channels over time among the members of a social system (Rogers, 2003). Fichman (2000) defines diffusion as the process by which a technology spreads across a population of organizations. The concept of diffusion of innovations usually refers to the spread of ideas from one society to another or from a focus or institution within a society to other parts of that society (Rogers, 1962). The whole theory of Innovation Diffusion can be divided into four main elements (Ismail Sahin, 2006).

**Empirical Review**

Gutierrez, Boukrami and Lumsden, (2015). Analyzed the factors influencing managers’ decision to adopt cloud computing in the united kingdom using the “Technology-Organisation-Environment” (TOE) model. They collected data through a self-created questionnaire based survey that was completed by 257 mid-to-senior level decision-making business and information technology (IT) professionals from a range of UK end-user organisations. The derived hypotheses were tested using various data analysis techniques including principal component analysis and logistic regression. The study found that four out of the eight factors examined have a significant influence on the adoption decision of cloud computing services in the UK. Those key factors include competitive pressure, complexity, technology readiness and trading partner pressure. The latter predictor; trading partner pressure, was the most significant factor for the adoption decision of cloud services reflecting organisations’ concerns on legal regulations, co-creation and customisation, service linkage and vendor locking which adds complexity to the process of selecting an appropriate vendor.

Gutierrez, Boukrami and Lumsden, (2015), found trading partners (cloud service providers) significantly influence managers’ decisions to adopt cloud services, however, further research is required to fully understand all the aspects involved especially with the growing number of vendors available. Although over 250 usable responses to the questionnaire were received and analysed, there was not a sufficient quantity of responses from each industry sector or organisation size to conduct further analysis. The study findings reveal the important role of cloud computing service providers to enable end-users to better evaluate the use of cloud computing. It also reveals that top management support is no longer a driver as organisations are starting to adopt cloud computing services on the basis of cheaper and more agile IT resources in order to support business growth.

Insurance industries are grappling with low interest rates, slow market conditions that are forcing the need for efficiency (Griffins, 2018). Rivalry among competitors is intense, while fintech innovators are increasingly developing products that offer consumers a variety of choices. System interoperability is one of the factors that affect insurance companies to adopt cloud platforms. O’Connor, (2017) Explained system interoperability as “the essential ability of computerized systems to connect and communicate with one another readily, even if widely different manufacturers developed them in different industries.” Information systems should have the capability to exchange information between applications, databases, and other systems are critical whether the system is pure cloud or hybrid
cloud. He further classified interoperability into: foundational interoperability where information system can exchange the data with others; Structural interoperability which looks at the format for the data transferred semantic interoperability where different parts of the system change information.

Security of systems is also a factor that affects cloud adoption. (Odisha, 2015) On his journal of data security challenges and its solutions in cloud computing explains how security is a significant factor when it comes to cloud adoption. He states that local data which is being hosted on the cloud by cloud providers have a due care to make sure the data is given utmost care at all times. There are factors to consider while moving or hosting your data in the cloud. Odisha, (2015) Stated the factors as data security and privacy, challenges in migration, lack clarity in pay per use model, and integration of cloud-based model with legacy systems. Ramachandra et al. (2017) Explain that Forbes stated that 47% of the companies would delay their migration to cloud due to security concerns about skills gaps, lack of maturity, and different best practices. Some of the most pressing urgent issue in the cloud that has affected quicker adoption are privilege user access management, regulatory compliance, data location, data segregation data protection, and recovery support and long term liability. The last factor system uptime.

The heart or core role of any insurance company is policy underwriting policies and strategies put in by the appraisal agents openly decide how sound the insurance business will be sustainable and whether it will make an ethical return through the premiums or not. Hassan, Herry, and Khairudin, (2016) On their journal of cloud computing in organization stated that there is an increase in studies that have been conducted about cloud adoption in an organization with significant factors being technological, environmental, and organizational. Several factors affect organization cloud adoption.

Hassan, Herry, and Khairudin, (2016) organization size, scope, and amount of slack resources available, market share, and market capitalization. Organisation technological readiness is critical in for any technological absorption. A case example is tala Credit Company in Kenya. Tala is technological ready, and they have embraced IBM Watson artificial intelligence, which is a cloud-based solution that they use for analysis and to predict the creditworthiness of their employees. Organization culture is fundamentally determined by the size and scope of the company (Lauren, 2015). Organization culture may lead to resistance to technological change (Wroblewski, 2018). He suggested several elements that may help the organization to transform from these barriers, develop channels of communication, and to bolster the hard skills by offering hands-on training.

Kenya data protection bill 2018 has highlighted some of the features of data management. Most insurance industries have shunned away from cloud computing dues to legal backing as they fear their trade secrets may be leaked to their competitors. Challenges about data governance have not only affected insurance companies but have also affected government agencies. A case example is during the Kenya electoral petition 2017 where the plaintiff stated the electoral servers which were held in the cloud platform in Europe could not be open due to the time difference. (Kahura, 2017).

With increased innovation and adoption of new technology they usually have both negative and positive effects to the environment, Cloud computing affects the situation in the following ways:- power conservation – data centers require a cooling system, a considerable amount of power. Each item within the data center requires a dedicated, uninterrupted power system. Cloud computing has helped reduced
power consumption drastically by going green through virtualization technology (Scholtz, Govender, and Gomez, 2016). One factor that has made cloud computing to be viable in insurance industries in South Africa according to (Scholtz, Govender, and Gomez, 2016) is lack reliable electric supply due to insufficient power on the grid coupled with reliability in the building of new data centers which are costly. She states that Africa can excel more in area of cloud computing if adoption is done through mobile phones are they can be charged off grid using solar systems and have a broader reach to the internet than standard servers in data centers. Another concern is stable, reliable internet usage.

Erratic internet services hamper adoption of cloud services as they affect real-time applications. On a positive side in most developed counties, cloud computing has been greatly adopted due to carbon credit management. Companies that invest in cloud computing using the dematerialization process will achieve lower power cost, a cooling system that demands more power. Scholtz, Govender, and Gomez, (2016) gave other environmental factors as - lack of approved cloud standards, transborder information flow, no national, local department or agency cloud adoption strategy or guidelines in place.

Haslinda et al. (2017) conducted a study to examine the factors that influence cloud computing adoption by the SMEs. The study conducted a quantitative survey-based study to examine the relationship external environmental pressure, and cloud computing adoption. The study found that external pressure significantly influences cloud computing adoption. Wang et al. (2017) noted that multiple factors influence the decision towards E-government cloud as drivers and barriers for its adoption. Their study was intended to gain insights concerning all contextual influences on the adoption attitude of E-Government cloud. The results of their study showed that there are perceived environmental barriers from cloud technology characteristics that can reflect the adoption decision of E-government cloud.

Independent Variables

Organizational Factors

Environmental Factors

Adoption of Cloud Computing

METHODOLOGY

This study used a descriptive research design. (McNeill, 2018) Descriptive research tends towards qualitative techniques but includes quantifiable data as well. Old Mutual-Uap had 4,000 employees countrywide but the study targeted the 483 employees at the Old mutual-Uap insurance headquarters office in Nairobi (Old Mutual-UAP, 2018). The study used the stratified random sampling method to select the sample size of respondents. This study utilized a questionnaire to collect primary data as used in various earlier research projects. Questionnaires were used since the study was concerned mainly with variables that cannot be directly observed such as views opinions, perception and feeling of the respondents. Questionnaires were distributed to the respondents then collected after the agreed period of time. Quantitative data collected was examined using descriptive statistics with help of a statistic software called statistical package for social sciences.
FINDINGS AND DISCUSSION

Technological factors and cloud computing

The first objective of the study was to ascertain influence of technological factors on the adoption of cloud computing in the insurance industry in Kenya. The respondents were presented with Likert-type statements aimed at responding to this objective. The findings obtained were presented in Table 1.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Weighted Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cloud computing provides a web communication between customers and Insurance companies</td>
<td>3.6118</td>
<td>.66395</td>
</tr>
<tr>
<td>There is integrity of data on cloud computing services</td>
<td>3.6087</td>
<td>.67280</td>
</tr>
<tr>
<td>Cloud computing provides confidentiality,integrity and availability traid</td>
<td>3.6704</td>
<td>.59688</td>
</tr>
<tr>
<td>Cloud computing provides public key infrastructure when accessing information</td>
<td>3.7255</td>
<td>.60829</td>
</tr>
<tr>
<td>It is extremely difficult to test DRP/BCP over the cloud</td>
<td>3.6118</td>
<td>.66395</td>
</tr>
<tr>
<td>Fear of visibility and transparency has affected adoption of cloud services</td>
<td>3.6087</td>
<td>.67280</td>
</tr>
<tr>
<td>Fear of loss of data has limited adoption of cloud computing within the insurance industry</td>
<td>3.6118</td>
<td>.66395</td>
</tr>
<tr>
<td>Fears of leaking of sensitive information has limited the adoption of cloud computing</td>
<td>3.6288</td>
<td>.68744</td>
</tr>
<tr>
<td>Security threats and vulnerability affected adoption of cloud computing</td>
<td>3.7153</td>
<td>.58211</td>
</tr>
<tr>
<td>Oldmutual-UAP employees can leverage their ICT professional skills in the cloud</td>
<td>3.7704</td>
<td>.58960</td>
</tr>
<tr>
<td>The cloud computing system can be easily integrated with other systems in the organization.</td>
<td>3.6118</td>
<td>.66395</td>
</tr>
<tr>
<td>The cloud computing system suppliers can be changed without compromising the security of the information</td>
<td>3.6087</td>
<td>.67280</td>
</tr>
<tr>
<td>Cloud providers have too many demands for provision of the services</td>
<td>3.5952</td>
<td>.63920</td>
</tr>
<tr>
<td>The organization has the necessary infrastructure to adopt the platform</td>
<td>3.99</td>
<td>.933</td>
</tr>
<tr>
<td>The organization will still keep control of its data</td>
<td>3.88</td>
<td>1.166</td>
</tr>
<tr>
<td>Functional compatibility with the existing systems has promoted adoption of cloud computing</td>
<td>3.90</td>
<td>1.002</td>
</tr>
<tr>
<td>Cloud infrastructure platforms help migrate the existing infrastructure investment to the cloud</td>
<td>3.96</td>
<td>1.062</td>
</tr>
</tbody>
</table>

Average Weighted Mean

3.712

With an average weighted mean of 3.712, and with weighted means ranging from 3.99 to 3.59, the respondents tended to agree to a great extent to the statement provided to them. As such, the respondents tended to agree to a great extent that: organizations that have the necessary infrastructure to adopt the platform which collaborates (Iacovou, Benbasat and Dexter, 1995) whom argued that organizations need financial resources to purchase assets to,assist in auditing of the third parties and that an organizational readiness for adoption of an innovation is dependent on technical skills and core IS capabilities build and leverage technology assets and plan an IT architecture. (Feeny and Willcocks, 1998)

The respondents also tend to agree to a very great extent that functional compatibility with the existing systems has promoted adoption of cloud computing which confirms (Wheeler (2002), (Zahra and George 2002) that dynamic capabilities, such as choosing new IT, matching economic opportunities with available technology, executing business innovation for
growth, assessing customer value, recognizing opportunities and developing absorptive capacity influences intergration of cloud computing system with other systems in the organization

The respondents also tended to agree to a very great extent that employees can leverage their ICT professional skills in the cloud since internally, e-transformation relies on competent employees who can manage an appropriate technical infrastructure and have ebusiness know-how. Externally, e-business technology availability is necessary. (Zhu et al. 2002).

The respondents also tended to agreed with the fact that there are fears of leaking of sensitive information has limited the adoption of cloud computing which supports the study done by (Ross, Beath and Goodhue 1996) that firms need a well-defined architecture, standards, and a reusable technology base.

**Organisational factors and cloud computing**

The study sought to examine influence of organizational factors on the adoption of cloud computing in the insurance industry in Kenya. The respondents were presented with Likert-type statements aimed at meeting this objective. The findings obtained are presented in Table 2.

<table>
<thead>
<tr>
<th>Table 2: Organisational Factors</th>
<th>Weighted Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Our products are performing well in the industry</td>
<td>3.91</td>
<td>1.109</td>
</tr>
<tr>
<td>We are well known by our products</td>
<td>3.99</td>
<td>.887</td>
</tr>
<tr>
<td>Our customers require tailor made solutions</td>
<td>3.87</td>
<td>1.054</td>
</tr>
<tr>
<td>Our revenue has muscle to shake-up the industry</td>
<td>3.98</td>
<td>1.056</td>
</tr>
<tr>
<td>Our voice of the customer is above peers</td>
<td>4.08</td>
<td>.901</td>
</tr>
<tr>
<td>Our marketing strategy is working well for the company</td>
<td>3.91</td>
<td>1.025</td>
</tr>
<tr>
<td>Senior management has been helpful in the use of the system</td>
<td>3.92</td>
<td>.970</td>
</tr>
<tr>
<td>My supervisor is very supportive of the use of the system for my job.</td>
<td>3.96</td>
<td>1.182</td>
</tr>
<tr>
<td>In general, the organization has supported the use of the system</td>
<td>4.01</td>
<td>.937</td>
</tr>
<tr>
<td>Senior management are concern about the effectiveness of the system</td>
<td>3.88</td>
<td>1.182</td>
</tr>
<tr>
<td>My supervisor understands company strategy</td>
<td>3.85</td>
<td>1.076</td>
</tr>
<tr>
<td>Senior management has created a well succession planning</td>
<td>3.90</td>
<td>1.058</td>
</tr>
<tr>
<td>My supervisor is well grounded on technical elements</td>
<td>3.85</td>
<td>1.137</td>
</tr>
<tr>
<td><strong>Average Weighted Mean</strong></td>
<td><strong>3.932</strong></td>
<td></td>
</tr>
</tbody>
</table>

As shown by an average weighted mean of 3.932 and weighted means ranging between 4.08 and 3.85, the respondents agree to a very great extent that a customer has a bigger voice that the peers and that customers require tailor made solutions which was argued by (Gulati and Garino 2000, Ranganathan, Goode and Ramaprasad 2003) that customizability of new e-products and e-services can lock in customers by presenting a tailored solution rather than a generic portfolio of products and services. Similarly, a real-time interface and aggregation effects, through integration of complementary products and services, such as brick-and-click synergy also have the potential to add value and lock in customers (Amit and Zott, 2001).
Lastly, the respondents tended to agree to a very great extent that senior management has been helpful in the use of the system; the supervisors are well grounded on technical elements, understands company strategy and have enabled the culture of supporting the subordinates on the use of the system for their tasks; in general, the organization has supported the use of the system; senior management are concern about the effectiveness of the system and senior management has created an elaborate succession planning which is in line with (Schein, 1992) who argued that he focus is on the organizational level, on the openness of organizational culture to innovation and processes that accommodate change as being essential factors for e-transformation. Organizational culture is associated with the organization’s sense of identity, its goal or core values, its primary ways of working and a set of shared assumptions and (Zhu et al. 2002) that organizational factors in terms of firm size; the centralization, formalization, and complexity of its managerial structure; the quality of its human resource; and the amount of slack resources available internally.

**Environmental factors and cloud computing**

The study sought to assess influence of environmental factors on the adoption of cloud computing in the insurance industry in Kenya. To this various Likert-type statements were presented to the respondents. The responses obtained were presented in Table 3.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Weighted Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impact on customer’s data put on the cloud has been slowed down due to lack of policy that governs personal data.</td>
<td>3.93</td>
<td>1.203</td>
</tr>
<tr>
<td>There should be regulatory policies on retention period of customers data kept on the cloud</td>
<td>4.23</td>
<td>.989</td>
</tr>
<tr>
<td>There are laws that govern processing of cloud data in a legitimate purpose</td>
<td>4.16</td>
<td>.884</td>
</tr>
<tr>
<td>There are laws that govern customer data over the cloud from abuse of disclosure</td>
<td>4.10</td>
<td>.995</td>
</tr>
<tr>
<td>Regulatory Policies on cloud adoption govern data that is kept in cloud services in third countries</td>
<td>4.12</td>
<td>1.018</td>
</tr>
<tr>
<td>There are regulatory policies and framework on how cloud computing service providers are audited by third parties.</td>
<td>4.03</td>
<td>.990</td>
</tr>
<tr>
<td>Regulatory Policies on cloud adoption do not support the quality of data provided</td>
<td>4.08</td>
<td>1.016</td>
</tr>
<tr>
<td>Competitors in the industry that use the system have more prestige than those who do not</td>
<td>4.17</td>
<td>.958</td>
</tr>
<tr>
<td>Competitors in the industry who use the system have a high profile</td>
<td>4.03</td>
<td>.983</td>
</tr>
<tr>
<td>The system has given the company a competitive advantage</td>
<td>3.94</td>
<td>1.109</td>
</tr>
<tr>
<td><strong>Average Weighted Mean</strong></td>
<td><strong>4.079</strong></td>
<td></td>
</tr>
</tbody>
</table>

As shown by the average weighted mean of 4.079, the respondents tended to agree to a very high extent to most of the statements presented to them. With means ranging from 3.93 and 4.23, the respondents tended to agree to a very high extent that: There should be regulatory policies on retention period of customers data kept on the cloud; Competitors in the industry that use the system have more prestige than those who do not and; There are laws that govern processing of cloud data in a legitimate purpose. These finding agree with (Zhu et al., 2003) who argued that competitive pressure, the regulatory environment and lack of customer readiness are environmental influences on e-transformation and further the findings of Iacovou,
Benbasat and (Dexter, 1995) that competitive pressure drives e-business adoption.

The respondents went on to a very great extent that adoption of cloud computing ought to have regulatory Policies on cloud adoption to govern data that is kept in cloud services in third countries. This agrees with (Andal-Ancion, Cartwright and Yip, 2003) who argued that the drivers of digital transformation include electronic deliverability, information intensity, customizability, aggregation effects, real-time interface and missing competencies.

The respondents went on to agree to very great extent that the laws that govern customer data over the cloud should be secured to prevent them from abuse of disclosure. This agrees with (Iacovou, Benbasat and Dexter, 1995) who showed that regulatory environment can both promote and slow e-business adoption and e-transformation. Government and industry regulations can force resources to be allocated for compliance. For example, government imposed Sarbanes-Oxley compliance has diverted resources for public traded companies and large automobile manufacturers imposed EDI adoption on suppliers.

It came out clearly that regulatory Policies on cloud adoption did not support the quality of data provided. These findings agree with Barrett and Carr, (2004) who argues that imposed standards are problematic if resources are not available and that standards are often slow to evolve because of the need to reach consensus.

The respondents also agreed to a great extent that there are regulatory policies and framework on how cloud computing service providers are audited by third parties. (weighted mean of 4.03). This is in agreement with Iacovou, Benbasat and Dexter, (1995) whom stated that organizations need financial resources to purchase assets to, assist in auditing of the third parties

**Adoption of Cloud Computing**

The study sought to investigate the adoption of cloud computing in Kenya. To this various Likert-type statements were presented to the respondents to establish their opinion on the study subject. The responses obtained were presented in Table 4.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Weighted Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Security and Access Controls (Risks)</td>
<td>3.86</td>
<td>1.086</td>
</tr>
<tr>
<td>It is easy to access the system</td>
<td>4.03</td>
<td>.970</td>
</tr>
<tr>
<td>There are strict system access controls</td>
<td>4.02</td>
<td>.974</td>
</tr>
<tr>
<td>Data is hard to corrupt in in the system</td>
<td>4.06</td>
<td>.931</td>
</tr>
<tr>
<td>The system can easily be hacked</td>
<td>3.88</td>
<td>1.199</td>
</tr>
<tr>
<td><strong>Average Weighted Mean</strong></td>
<td><strong>3.97</strong></td>
<td></td>
</tr>
</tbody>
</table>

As shown by the weighted mean of 3.97 the respondent tended to agree to a great extent to the statements provided to them. In this regard, the respondents tended to agree that security and access controls (Risks) are an issue; it’s easy to access the system; there are strict system access controls; the system can easily be hacked and data is hard to corrupt in in the system findings that agree with (Akhusama and Moturi, 2016) that various challenges like business continuity within the insurance companies, service availability, data lock-in, data confidentiality, data transfer bottlenecks, and software licensing are greatly reduced by cloud computing.
Correlation Analysis

The overall correlation analysis results were presented in Table 5.

**Table 5: Overall Pearson Correlation Matrix**

<table>
<thead>
<tr>
<th></th>
<th>CC</th>
<th>OF</th>
<th>EF</th>
<th>TF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Correlation</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>187</td>
<td>187</td>
<td>187</td>
<td>187</td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td>.822**</td>
<td>.758**</td>
<td>.726**</td>
<td>.675**</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>187</td>
<td>187</td>
<td>187</td>
<td>187</td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td>.708**</td>
<td>.694**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>187</td>
<td>187</td>
<td>187</td>
<td></td>
</tr>
</tbody>
</table>

**. Correlation is significant at the 0.01 level (2-tailed).

The relationship between Organizational factors and Cloud computing was 0.822 and was significant as supported by a probability value of 0.000 (p<0.05). The relationship between environmental factors and Cloud computing was 0.758 and was significant as supported by a probability value of 0.000 (p<0.05). The relationship between Technological factors and Cloud computing was 0.726 and was significant as supported by a probability value of 0.000 (p<0.05). The relationship between Organizational factors and technological factors was 0.675 and was significant as supported by a probability value of 0.000 (p<0.05). The relationship between Technological factors and Environmental factors 0.694 and was significant as supported by a probability value of 0.000 (p<0.05).

Regression Analysis

**Univariate Regression Analysis between Technological factors and adoption of cloud computing at Old Mutual**

The first objective of the study was to establish the influence of technological factors on cloud computing. Regression analysis was conducted to empirically determine whether or not Technological factors significantly determine cloud computing. The results were presented in table 6 below;

**Table 6: Univariate Regression Analysis of Technological Factors**

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Model Summary</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.726a</td>
<td>.527</td>
<td>Adjusted R Square</td>
<td>.41193</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), TF
The results in Table 6 showed a relationship $R = .726$, which indicated a positive association between technological factors and cloud computing. The relationship was significant as supported by a probability value of 0.000 ($p<0.05$). This implied that the model applied could statistically and significantly predict the outcome variable. The study therefore, rejected the null hypothesis, $H_o$ and concluded that technological factors have a significant influence on cloud computing.

Table 7: ANOVA for Technological Factors

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>ANOVA$^a$</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.$^b$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>29.091</td>
<td>1</td>
<td>29.091</td>
<td>171.441</td>
<td>.000</td>
</tr>
<tr>
<td>1</td>
<td>Residual</td>
<td>26.131</td>
<td>186</td>
<td>.170</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>55.222</td>
<td>187</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Dependent Variable: CC  
b. Predictors: (Constant), TF

The overall model significance was presented in Table 7. The ANOVA results indicated that the regression model predicts the outcome variable statistically significantly well with $F$ statistic of 171.441. This indicated that the overall model was significant at 5% level and the relationship was not just by chance. This was supported by a probability value of 0.000 ($p<0.05$). This implies that the model applied could statistically and significantly predict the outcome variable. The study therefore, rejected the null hypothesis, $H_{o1}$ at 5% level of significance and concluded that organizational factors have a significant influence on adoption to cloud computing at Old Mutual. These results collaborate the findings by (Harfoushi et al., 2016) who stated that ICT infrastructure and ICT human resource readiness is critical to cloud computing success.

Univariate Regression Analysis between Organizational factors and adoption of cloud computing at Old Mutual

The second objective of the study was to establish the influence of organizational factors on cloud computing. Regression analysis was conducted to empirically determine whether or not organizational factors significantly determines cloud computing. The results were presented in Table 8.

Table 8: Univariate Regression Analysis of Organizational factors

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.822$^a$</td>
<td>.675</td>
<td>.673</td>
<td>.34122</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), OF

The results in Table 8 showed a relationship $R = .822$, which indicated a positive association between organizational factors and cloud computing. The relationship was significant as supported by a probability value of 0.000 ($p<0.05$). This implies that the model applied could statistically and significantly predict the outcome variable. The study therefore, rejected the null hypothesis, $H_{o2}$ and concluded that organizational factors have a significant influence on adoption of cloud computing.
Table 9: ANOVA for Organizational factors

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>37.291</td>
<td>1</td>
<td>37.291</td>
<td>320.283</td>
<td>.000b</td>
</tr>
<tr>
<td>1</td>
<td>Residual</td>
<td>186</td>
<td>.116</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>55.222</td>
<td>187</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Dependent Variable: CC  
b. Predictors: (Constant), OF

The ANOVA results indicated that the regression model predicts the outcome variable statistically significantly well with F statistic of 320.283. This indicated that the overall model was significant at 5% level and the relationship was not just by chance. This was supported by a probability value of 0.000 (p<0.05). This implied that the model applied could statistically and significantly predict the outcome variable. The study therefore, rejected the null hypothesis, H₀₁ at 5% level of significance and concluded that organizational factors have a significant influence on adoption to cloud computing at Old Mutual. These results collaborated similar findings by (Ismail, 2016) who looked at the organization characteristic as financial readiness, organization culture, technological readiness, and level of satisfaction with existing systems and found they positively influence cloud computing effectiveness.

Univariate Regression Analysis between Environmental factors and adoption of cloud computing at Old Mutual

The third objective of the study was to establish the influence of environmental factors on cloud computing. Regression analysis was conducted to empirically determine whether or not environmental factors significantly determines cloud computing. The results were presented in table 10.

Table 10: Univariate Regression Analysis of Environmental factors

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.758a</td>
<td>.575</td>
<td>.572</td>
<td>.39027</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), EF

The results in Table 10 showed a relationship R = .758, which indicated a positive association between environmental factors and cloud computing. The relationship was significant as supported by a probability value of 0.000 (p<0.05). This implies that the model applied could statistically and significantly predict the outcome variable. The study therefore, rejected the null hypothesis, H₀₁ and concluded that environmental factors have a significant influence on adoption of cloud computing.

Table 11: ANOVA for Environmental factors

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>31.765</td>
<td>1</td>
<td>31.765</td>
<td>208.550</td>
<td>.000b</td>
</tr>
<tr>
<td>1</td>
<td>Residual</td>
<td>186</td>
<td>.152</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>55.222</td>
<td>187</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Dependent Variable: CC  
b. Predictors: (Constant), EF
The ANOVA results indicated that the regression model predicts the outcome variable statistically significantly well with F statistic of 208.550. This indicated that the overall model was significant at 5% level and the relationship was not just by chance. This was supported by a probability value of 0.000 (p<0.05). This implied that the model applied could statistically and significantly predict the outcome variable. The study therefore, rejected the null hypothesis, \( H_{01} \) at 5% level of significance and concluded that environmental factors have a significant influence on adoption to cloud computing at UAP-Old Mutual. These results refute the findings by (Tehrani, and Shirazi, 2014) who did not find enough evidence that competitive pressure was a significant determinant of cloud computing adoption.

**Regression Analysis Summary**

**Table 12: Regression Analysis Summary**

<table>
<thead>
<tr>
<th>Objective</th>
<th>Hypothesis</th>
<th>Proposed Data Analysis</th>
<th>Results Interpretation</th>
<th>Empirical model results</th>
</tr>
</thead>
</table>
| To determine the influence of technological factors on adoption of cloud computing | Technological factors have no significant effect on adoption of cloud computing | Pearson’s correlation, Simple regression analysis \( CC = \beta_0 + \beta_1 TF + \epsilon \)  
\( CC = 1.347 + 0.644TF \) | If P value is <0.5 then significant linear relationship was noted – Statistical significance will be at \( \alpha < 0.5 \) | R=0.726  
\( R^2 = 0.527 \)  
P=0.000  
There is a significant relationship between technological factors and cloud computing |
| To establish the effect of Organizational factors on adoption of cloud computing | Organizational factors have no significant effect on adoption of cloud computing | Pearson correlation  
Stepwise Multiple Regression Analysis \( CC = \beta_0 + \beta_2 OF + \epsilon \)  
\( CC = 0.666 + 0.6803OF \) | If P value is <0.5 then significant linear relationship was noted – Statistical significance will be at \( \alpha < 0.5 \) | R=0.822  
\( R^2 = 0.675 \)  
P=0.000  
There is a significant relationship |
| To establish the effect of environmental factors on adoption of cloud computing | Environmental factors have no significant effect on adoption of cloud computing | Simple regression analysis will be used \( CC = \beta_0 + \beta_3 EF + \epsilon \)  
\( CC = 1.208 + 0.682EF \) | If P value is <0.5 then significant linear relationship was noted – Statistical significance will be at \( \alpha \geq 0.5 \), coefficient of determination \( (R^2) \) | R=0.758  
\( R^2 = 0.575 \)  
P=0.000  
There is a significant relationship between Environmental factors and cloud computing |
| To establish the effect of organizational, environmental factors and Technological | Organizational factors, environmental factors and Technological factors have no jointly | Multiple regression analysis was used \( CC = \beta_0 + \beta_1 TF + \beta_2 OF + \beta_3 EF + \epsilon \)  
\( CC = 0.339 + 0.187TF \) | If P value is <0.05 then significant linear relationship was noted – Statistical significance will be | R=0.870  
\( R^2 = 0.758 \)  
P=0.000  
There is a significant relationship between technological factors |
Based on the study findings, the hypothesis equation model becomes

Adoption of Cloud Computing = 0.339 + 0.187TF + 0.485OF + 0.236EF

From the findings, the study found that holding Technological factors, Organizational factors and Environment factors constant, Adoption of cloud computing would be at 0.339. It was established that a unit increase in Technological factors while holding other factors (that is, Organizational factors and Environment factors) constant, will lead to an increase in adoption of cloud computing by 0.187 (p = 0.000). Further, a unit increase in Organizational factors, while holding other factors (that is, Technological factors and Environment factors) constant, will lead to an increase in adoption of cloud computing by 0.485 (p = 0.000). A unit increase in Environment factors, while holding other factors (that is, Technological factors and Organizational factors) constant, will lead to an increase in organizational performance by 0.236 (p = 0.000).

This infers that Technological factors, Organizational factors and Environment factors all have a significant relationship with the adoption of cloud computing at 5% level of significance and 95% level of confidence. However based on the explanatory power of coefficient of determination the independent variables (organizational factors have the highest expalantory power of 0.675 or 67.5%, P<0.05, thus being the most significant Variable; Environmental Factors has 0.575 or 57.5%, P<0.05 while Technological factors are the least significant with 0.527 or 52.7%, P<0.05). This showed that all the variables have significantly relationship with the dependent variable (adoption of Cloud Computing).

The significant positive relation between Technological factors and adoption of cloud computing collaborate the findings of (Kiriinya, 2014) who argued that technological factors were the most significant factor that affected CIC insurance from adopting cloud services by looking into the perceived usefulness and ease of use as the contributors to the technological elements. Similary these findings also collaborate (Borgman, Bahli, Heier and Schewski, 2013) whom indicated that the technology and organization context affect implementation decisions.

The significant positive relationship between organizational factors and adoption of cloud computing agree with (Zhu et al. 2002) that the focus is on the organizational level, on the openness of organizational culture to innovation and processes that accommodate change as being essential factors for e-transformation. Similary findings were put across by (Chatterjee, Grewal and Sambamurthy, 2002) whom concluded that consequently, organizational age is likely to slow down e-transformation and Web assimilation.

The significant positive relationship between Environmental factors and adoption of cloud computing agrees with (Awa and Liu, 2016) who found that environmental context tells of operational facilitators and inhibitors context such as external support, competitive pressure, and trading partners readiness are vital features to adhere to when implementing the TOE framework under the environmental context. Similary the research study collaborates the findings of (Haslinda et al. 2017) who conducted a study to examine the factors that influence cloud computing adoption and found that external pressure significantly influences cloud computing adoption.
CONCLUSIONS
On the basis of findings of the study, a number of conclusions were made. To begin with, it was evident that Technological factors influence the adoption of cloud computing at the Old Mutual-Uap, Nairobi, Kenya. It was made apparent that the success of cloud computing relies heavily on the ICT infrastructure and ICT human resource readiness.

Regarding the influence of Organizational factors on the adoption of Cloud computing, the research study concluded that the organizational context is about its characteristics and resources since organizational context also relates to the structure and processes of a corporate ecosystem that constrain or facilitate the adoption and implementation of innovations within it. Further the institutions should also focus on top management support since it is stated that senior leadership is the sponsors of innovation.

Finally on the influence of Environmental factors on the adoption of cloud computing, the significance of competitive pressure that fosters and drives e-business adoption was stressed and the importance of regulatory environment and lack of customer readiness are environmental influences was also found to be of great importance by this research study.

RECOMMENDATIONS
The study suggested pertinent recommendations citing information from theoretical review and the study findings in line with the specific objectives of the study. The objectives were to investigate the influence of technological, organizational and environmental factors affecting adoption of cloud computing.

The study further recommended that to be able to develop new ideas, employees must have enough knowledge about the field they operate in to move it forward. The support for knowledge sharing and exchange of ideas in the in the work place is therefore argued as important for adoption of cloud computing. To support this, a work environment that is tolerant and welcomes new ideas, which includes freedom and challenges at work, shared objectives and open relationships between colleagues and managers were recommendable.

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