Cloud Computing in Kenya

A 2013 Baseline Survey

In many respects, developing markets have opportunities to leap frog by adopting cloud computing technologies that result in many benefits, such as cost cutting and speed of processing. For these technologies to be implemented appropriately and adopted, several critical elements must be in place. Governments must put in place supportive legal and regulatory frameworks, suppliers must make the technology available, technical people must have the right skills and consumers must have the right knowledge and attitude.

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Cloud computing is a few years old in Kenya. Private Cloud is more popular.

57% of the respondents indicated they adopted cloud technology in either 2010 or 2011. More organizations utilized pure private cloud (39%) compared to utilizing a public cloud (22%).

Majority are not aware of cloud computing standards, policy or legal frameworks

75% are not aware of any standards. 80% are not aware of policy or legal frameworks. Those aware feel the frameworks are not as comprehensive, flexible and effective as they ideally should be.

Market is ready for cloud technology but awareness and skills are low

90% of the respondents thought the cloud services market was ready but there are a lot of misunderstandings about the technology. Some technical skills are seriously lacking.

Government to be the champion by promoting and adopting cloud

By adopting the cloud, the government would set pace for better uptake by the private sector. By providing services through the cloud, the government is likely to improve overall quality of delivery.

Introduction

Cloud computing has emerged in recent years as a technology that can help developing countries to leap frog in certain areas such as cost cutting and speed of processing. However, not much research has been done in this area. For cloud technologies to be implemented appropriately and adopted, several critical elements must be in place. Governments must put in place supportive legal and regulatory frameworks, suppliers must make the technology available, technical people must have the right skills and consumers must have the right knowledge and attitude.

This research investigated the status of cloud computing in Kenya, a developing nation that has demonstrated leadership in developing and adopting appropriate technological innovations. The study explores the circumstances, challenges, opportunities and limitations facing the country in her quest to exploit cloud computing technologies. In conclusion the report provides a set of recommendations that could spur the development of the sub-sector.

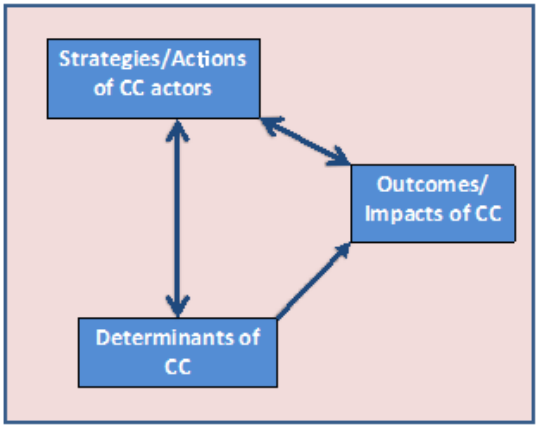
The study was limited to institutions that have a physical presence in Nairobi, the capital city of Kenya. The focus on Nairobi was based on the fact that most organizations in Kenya have their headquarters in Nairobi which is the economic hub of East Africa. In addition, the budgetary allocation for the research project could not allow covering cities beyond Nairobi.

Within the sample identified, there were providers, consumers and policy makers. The providers were grouped into Infrastructure as a Service (IaaS), Software as a Service (SaaS) and Platform as a Service (PaaS). Providers and consumers were also classified as either utilizing public or private clouds.

Methodology

A framework (see Figure 1) was identified from literature, modified and adopted. It explains contexts, mechanisms and processes associated with the development of the cloud industry in the developing world in terms of three inter-connected flows: determinants, cloud related strategies or actions and impacts or outcomes of the cloud computing. A questionnaire with a total of 36 questions and an in-depth interview guide was developed from the framework.

Figure 1: Conceptual Framework for the study



A stakeholder analysis was done, and a total of 207 organizations were identified who could participate in the study. From this set, a sample of 60 organizations was randomly picked. The distribution is summarized in Table 1 below:

Table 1: Sample distribution and identification

Category	Population	Sample
Government entities	14	8
Banks	10	4
Consulting firms	5	4
Insurance firms	10	4
Hospitals	9	4
Universities	10	4
Business and Industries	24	8
Technology companies[1]	25	8
SaaS Companies	11	8
PaaS Companies	3	0
IaaS Companies	18	8
Total	**207**	**60**

Data collection was done between October 10th, 2013 and November 10th, 2013 where ICT Managers, Information Security Managers, Network Administrators or Chief Information Officers were interviewed. Of the 60 organizations picked, a total 54 participated in the survey. Further, a total of 7 in-depth interviews were carried out, targeting policy makers, opinion leaders and large organizations involved in cloud computing.

Findings

Use of cloud technology is becoming popular among organizations. The study established that 70% of the organizations were utilizing cloud in one way or another.

Cloud computing in Kenya is fairly recent, with most organizations having adopted in either 2010 or 2011 implying that the impact of the technology is limited. More organizations utilize pure private cloud (39%) compared to public cloud (22%), a choice primarily driven by perceived security concerns and control.

Because of the preference to private clouds, the key barrier to entry has been the cost of investment. Lack of technical skills has significantly hampered the adoption and usage of cloud. Specific skills mentioned as lacking are security, architecture and design, storage and virtualization. Concerns about the reliability of service, security and privacy of data, geographical location of the data are some of concerns of potential and current users or providers.

Majority of the sub-sector players are not aware of standards, policy or legal frameworks for cloud computing. For those who are aware, majority indicated that these frameworks were not as flexible, comprehensive and effective as they would have wished. The policy framework was viewed as somewhat more effective than the legal framework.

Though consumers appear relatively unaware of the details and capabilities, the cloud services market is generally ready with the leading consumers being the financial and telecommunications sectors. The leading providers are Safaricom, Dimension Data and KDN.

Recommendations & Policy implications

The government should strongly welcome and support cloud computing technology to increase user confidence and accelerate adoption and exploitation.

Regulatory mechanisms need be sought to bring down the cost of entry into the business and reduce the cost to the end consumer. The ICT policy and legal frameworks should be reviewed to promote cloud computing and ensure that these frameworks are flexible and effective. The frameworks should create an enabling environment for organizations to invest in cloud systems, migrate their data and systems with ease and safety. Specific and targeted laws will help ensure the protection of end users particularly data protection, information security, privacy and cybercrime.

The government will need to develop mechanisms to ensure reliable supply of power and address the infrastructural challenges. Reliable power supply to data centres, availability of reliable and affordable bandwidth and a capability to monitor the quality of services are vital for developing confidence in cloud technology.

In a nutshell, consistent with other studies and literature the following interventions are recommended:

1. **Assessment of the cloud readiness of the country:** to clearly understand the current situation at national level through an elaborate national study.
2. **Developing a national cloud strategy:** focusing on issues like capacity building, architectures and implementation.
3. **Government as a champion of cloud services:** by adopting use of the cloud to provide services, government would set pace for better uptake by the private sector.
4. **Enhance the relevant legal and regulatory frameworks:** protection of cloud service users, addressing cyber security challenges, guaranteeing secure online payments, privacy and data security need to be clearly articulated.
5. **Develop the human resource capacity:** technical skills, legal skills and management skills to ensure contracts are well formulated and managed need to be developed.
6. **Enhance the awareness of cloud technologies:** through a multi-stakeholder approach, the technology needs to be demystified and accurate information sent to potential consumers.

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[1] Some of the technology companies coupled as SaaS, PaaS or IaaS.