

TOWARDS THE ADOPTION OF BRING_YOUR_OWN_DEVICE CONCEPT IN AN ORGANIZATION

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ABSRTACT

Bring_Your_Own_Device (BYOD) concept has gained momentum at the workplace in many organization but its adoption approaches are varied. An unstructured technology adoption of BYOD concepts might be catastrophic for an organization in terms of security breach, compromise in privacy, infrastructural control, among other challenges. This study aims at developing a model to guide in the adoption of BOYD concept in the telephony industry. Exploratory and adopted survey research design were used so as order to gain advantage from its intrinsic ability in describing the characteristics of a large population. The target population in the study was mobile telephony industry players with a sample consisting of four (4) members of management staff and two hundred and eight (208) other staff members. Based on the key findings, the study proposes Hybrid BYOD Model which integrates the aspect of specific Functionality model and Integrated Model of BOYD to answer to the key concerns on the adoption of BYOD concept by an organization in Kenya.

Key Words: *BYOD concept, BYOD Models, Mobile devices, Technology adoption*

Introduction

The concept of BYOD is described as the process or act whereby the organizational management allows its employees to use their personal devices such as laptops, mobile phones among many others for work purposes (Brandly, 2011). According to an article written on “what is Bring Your Own Device (BYOD)”, it was noted that the two major causes of BYOD phenomenon include the efforts of organizations to reducing complexity and cost of managing mobility and employees wanting to use the most popular devices that they use as consumers, instead of the device provided by their employer (Garlati, 2011). In a 2011 Trend Micro report, Garlati noted that employees preferred to use their own personal devices in the workplace because they were

easier to use, more convenient and allowed them to mix their personal and work-related information.

On a more evolving society, the trend of adopting the BYOD policies in organizations is becoming more important. For instance, various organizations in China (53 per cent), Brazil (51 per cent) and the USA (50 per cent) are looking forward to having the formal BYOD policies in place. Despite, the rush for organizations to adopt these policies, there are certain countries where the companies are least likely to adopt the policies despite its existence in the country (BT, 2012). There are some benefits that may result from adoption of BYOD concept by an organization. For instance, businesses that adopt a BYOD policy allows itself to save money on high-priced devices that it would normally be required to purchase for their employees. Employees may take better care of devices that they view as their own property. Companies can take advantage of newer technology faster. On the other hand, the employees may also be able to decide on the technology that they wish to use for work rather than being assigned a company device. Exclusive control of features is given to the employee.

BYOD within Mobile Telephony Industry in Kenya

Kenya mobile telephony industry accounts for 7% of mobile phone subscribers in sub-Saharan Africa. According to CCK quarterly report (2010/2011), September 2010, Kenya had 22 million mobile phone subscribers. The International Telecommunications Union (ITU) report says that Kenya has the third highest number of subscribers, after Nigeria and South Africa which respectively account for 26% and 19% of mobile cellular subscriptions in sub-Saharan Africa. Mobile penetration in Kenya's telecom market is expected to grow by 95% over the next five years. According to Dearbhla (2010), by the end of 2008, Kenya had more than 15 million mobile subscribers, with a mobile penetration rate of 39%. The subscriber base is expected to rise to 29.28 million, or 66.7% penetration, by year-end 2013 (Dearbhla, 2010). The managers of these companies need to go back to the drawing board various elements so as to cope up with the enlargement of the company while at the same time regulating their investments on the organizational infrastructures for better service provision. As such, these organizations may be deemed to adopt the concept of BYOD so as to enable them operate with technologies devices from their staff members in providing quality services while at the same time regulating the amounts invested in the infrastructure for the other developments in the organization

Statement of the Problem

The concept of BYOD in Africa and especially in the Kenyan organizations has not been adopted fully. Most of the organizations have their own preservations when it comes to the integration of employees' own devices with the organizational infrastructures. Some of the concerns raised relate to visibility, specification of software, data access, and data protection that require organizations to re-assess their existing security and management strategy (Stacy

2011). All these challenges have been traced to absence of standardized models for the analysis and harmonization on the integration and utilization of the concept of BYOD. This study intends to propose a BYOD model that can guide in the integration of own devices with organization's infrastructure with reference to the mobile telephony industry in Kenya.

Objectives of the Study

1. To explore to what extent do organizations benefit from the adoption of BYOD
2. To explore the likely challenges that may be experienced in the adoption of BYOD
3. To identify key aspects of BYOD adoption
4. To develop a model to guide in the adoption of BYOD concept in Kenyan organizations

Literature Review

Theoretical Review

The history of the BYOD concept maybe linked to the increased and continued development of ICT integration on various electronic devices such as computers and mobile phones. Over the recent past, technology companies such as the apple and Samsung among others have been able to modify the cell phones among other electronic gadgets to meet their consumers' day to day demands (Samsung, 2012). With various features among the electronic devices that were able to handle office duties, employees became more interested and active in handling their office given tasks using their gadgets over the office devices. Moreover, the concept has enabled employees to transition between business and personal tasks seamlessly; allowing them to work when they are most motivated (Trend Micro incorporated, 2012). As the time went by organizations realized that employees were more into using their own devices in executing the organizations' duties. With the idea, organizations opted to continue the concept by allowing employees to come with their own devices at work. However, there are various organizations that have not fully embraced the concept of BYOD due to the challenges that comes with it such as insecurity of important data, and weak policies and regulations on the concept among many others (ISACA, 2011).

It can also be noted that the BYOD "revolution" as it's called is only revolutionary for IT departments that have to grapple with an unknown quantity of devices literally penetrating the organization every morning. IT complexity may be further driven by the variance in the security and conformity of those devices with established norms, if such norms even exist. Users often have multiple devices and those devices rarely match any preconceived ideas about what a "standard" device might look like within the organization. Moreover, it can generally be noted that the IT departments drove technology, but IT revolution has shifted the IT culture so that the

users are the ones getting the latest, cutting edge technologies first, and they want to bring those devices to work (Brandly, 2011).

Currently, the 'bring your own device' trend has become an increasingly popular one over the last few years. A survey by ISACA (2011) suggests that 54% of employees have a personal device they use for work. Employees enjoy the freedom the BYOD scheme offers, and company balance sheets look healthier for the minimized hardware it spends. But the convenience of BYOD is accompanied by significant data security risks, which can prove enormously costly. Brandly (2011) notes that various organizations have grown to not only tolerate the use of personally-owned and user-liable devices, but actually encourage and sponsor it.

Organizations that allow employees to work with the technology they are most comfortable with tend to have more satisfied employees while also enjoying the addition advantage of cost savings according to Crook (2011). Further, Niharika (2012) observes that organizations that embrace BYOD policy have happier, productive, and collaborative employees. Thus use of personal devices in work place has its own positive elements from the employee's point of view. For instance, when employees are allowed to use own devices, they are likely to enjoy increased mobility, higher job satisfaction, and improvements in efficiency and productivity. From a corporate point of view, the innovative BYOD business model, and its attractiveness to employees, provides a competitive advantage over others in the industry. It can help to attract and retain top performers in the business, who seek to work flexibly, and often put in time outside of traditional work hours do the efficiency of BYOD. In addition to that, the employees' on boarding and training time is also reduced, thus making them become more efficient and productive. According to a study carried out by Cisco (2012) "two out of three employees worldwide said they would take a job with less pay and more flexible in device usage, access to social media, and mobility than a higher paying job without such flexibility. Sixty per cent said they no longer need to work in an office to be productive".

According to study carried out by Aruba Network (2012), in Sunnyvale, California, it was reported that 85% of the hospitals supported the use of personal device for work. Although among the hospitals only 8% enabled full access to corporate networks to use applications such as Electrical Medical Records that is expected to grow quickly as pressure mounts on IT to open access to physician and other clinical personnel. Another related study conducted by IDC Health Insight of 50 healthcare CIOs in the US and Europe on a November 2011 revealed the same statistics (Andreas, 2011).

The integration of organization infrastructure and personal devices also has a lot benefits to the organization. some of these benefits include improved alignment between corporate objectives and real estate/facilities, increased visibility into an organization's entire real estate and facility portfolio, increased revenues by reducing cycle times for new facilities, decreased operating costs to manage existing facilities and assets and finally it can help in elimination of multiple

point-solutions that require training and support and are ineffective in lifecycle management (Bodrozic, 2005).

Organizations which have adopted a BYOD strategy often cite employee satisfaction and business productivity as key advantages (Edelheit, et. al. 2012). Other benefits include enhanced collaboration and mobility, expanded mobile access to resources, reduced spending on sourcing and support of devices, lessened responsibility for device lifecycle management, as well as consolidation of infrastructure and tools across many IT disciplines. An infrastructure that allows access from a large set of device types must be secure. An advantage of a device-agnostic infrastructure is that security is integrated into the design; it is not, as with traditional infrastructure, an overlay.

Modern personal devices such as tablets, laptops and smart-phones provide portability without much of a compromise in computation power (John, et. al. 2012). Portability ensures on-demand communication, allowing employees to solve time-critical problems from remote locations, obviating traffic-delays and inaccessibility to software resources. Enabling remote access of resources through these devices results in a higher expectation in productivity as remote employment negates the need to arrive within stringent office hours or work in a constrained professional environment. This flexibility is important in attracting employees with pressing family commitments or members of the society with disabilities, to name a few.

Organizations which have not accepted BOYD concept in their organization often consider it to be a risky undertaking for the organization. They classify risks of BYOD into two broad categories. The first set of risks relates to the fact that a company's data is now being stored and transmitted using devices and networks the employer may not own or control. This loss of control may clash with the growth over the last decade of government regulations requiring companies to carefully protect the privacy and security of sensitive personal, financial, and health-related data. It can as well pose risks to the protection of a company's trade secret, proprietary, or confidential information. Another set of risks relates to the impact BYOD policies may have on the behavior of employees.

Many of the challenges faced in the adoption of BYOD are addressed through the use of new types of software, typically referred to as Mobile Device Management software, that give employers a measure of control over their employees' dual-use devices. Unfortunately this software can only mitigate, not eliminate, these challenges. Employers must therefore consider revising or creating new policies and operating procedures, entering into new or supplemented employee agreements, and developing a broad awareness of these issues among their employees. This is more than rewriting the company's Acceptable Use Policy as well (Moschella, 2005).

Companies that adopt a BYOD policy may have their corporate data stored on personal devices owned by their employees. This creates several data-related challenges for companies, especially those in highly regulated environments, such as healthcare, financial services, and those that

handle sensitive personal information. Best practices such as turning on auto-locking; password protection and enabling encryption, plus the cost of funding security awareness and user education can solve a lot of the mobile access problem (Harris, 2012). Another possible challenge is the fact that employees are using devices they own, and therefore it may change their expectations regarding what constitutes appropriate use of the device. This change could create significant conflict with other company policies. In fact, recent research conducted shows the personal “ethics” or “morals” of some workers who are active “social networkers” sharply diverge from other workers on key issues. In the 2011 National Business Ethics Survey (NBES), the Ethics Resource Center reported that active social net-workers are more likely to believe that certain questionable behaviors are acceptable (Empason, 2001).

An Overview of existing BYOD concept adoption Models

Integrated Model of BYOD

The models of BYOD adoption differ from one level of needs to another (Alberta Education 2012). This is best illustrated on the Integrated Model of BYOD shown in figure 1. The Integrated model is based on the range of acceptable devices which fall onto a continuum ranging from high standardization to high flexibility. At one end of the spectrum (standardization) is the identification of a single type of device that all device-owners must purchase. At the other end of the spectrum (flexibility), is an open-ended model that encourages the device owners to bring with them any device. Integrated model combines a number of aspects: limiting the devices to a specific brand or model, limiting the devices to those that meet specific technical specifications, limiting the devices to those with specific functionality and devices that are Internet-ready (Alberta Education, 2012).

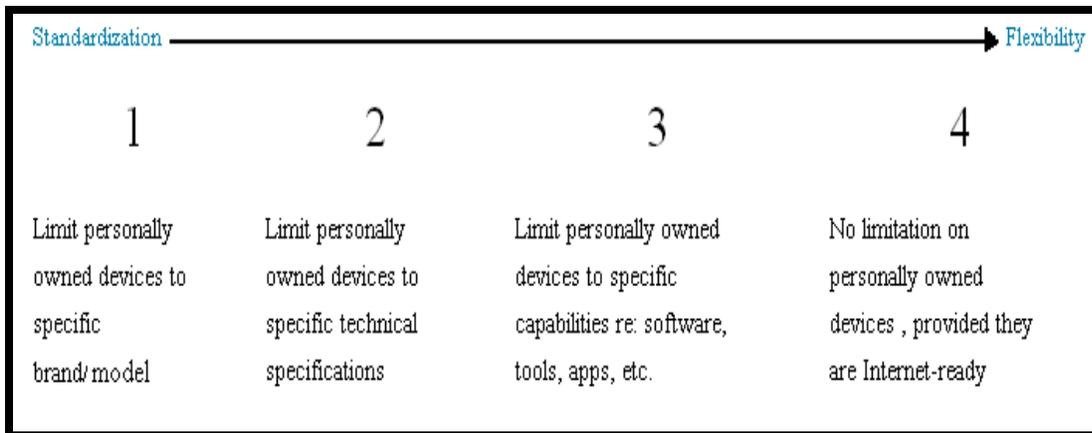


Figure 1: Classification of BYOD Models from the Least to the Most Flexible

Source: Alberta Education (2012)

Specific Functionality Model of BYOD

The Specific Functionality model focuses on the personally owned devices with particular functionality like specific versions of operating systems, minimum amount of storage space, Internet ready among other features. Under this model employees are free to bring their own devices provided they have certain features as may be required. The setting of the features a device must possess tries to establish standardization of capabilities, thus offering some uniformity hence ease of implementation. It however has inherent weaknesses which relates to different platforms of the devices which may cause some problems in terms of technical support (Alberta Education, 2012).

Research Methodology

An exploratory research design was adopted in this study so as to gain advantage from its intrinsic ability in describing the characteristics of a large population. Mobile telephony industry was used as a case study due to its advancement in technology with a focus on the four main telecommunication companies in Kenya. The sample selected from the four telecommunication companies consisted of four (4) members of management staff and two hundred and eight (208) respondents. The study employed questionnaires and interview guides to collect data from the staff members and the managers. The primary data was collected from the selected sample using structured questionnaire and interviews. The Questionnaire was administered across the different professionals from Mobile telephony industry. An in-depth interview with the managers was used to solicit information that was useful in determining the integration of own devices and organization's infrastructure in the mobile telephony industry in Kenya. Data was analyzed to obtain descriptive statistics using SPSS.

Results and Discussion

The data analysis include four parts: Basic ackground characteristics of the respondents, benefits of adopting 'Bring your Own Device' Concept, Components of BYOD and Organization Infrastructure, challenges faced in the adoption of BYOD concept.

Devices Owned by the respondents

The devices owned by the respondents include: Smart-phones (54%), Laptops (30%) and Tablets (16%). The affinity of the staff to own such devices is also supported by ability of these devices to provide portability without much of compromise in computation power (John, Robert, Oliver, Will, Rachel, 2012).

Benefits of Integrating Own Devices

The study sought to find out the benefits associated with BYOD to an organization. The following were identified to be the key benefits associated with integration of own devices in the workplace: cost saving by the organization (45.9%), staff members are responsible in resource utilization (95.9%), provides the ease of use (66.2%) since they are they are more conversant with their use/functionalities, facilitated the enhancement of overall work performance(62.1%), enhanced work flexibility 95.9%), enhanced Job collaboration among the members of staff (98.7%), enhanced job satisfaction(86.5%), and increased organizational productivity, (83.7%). Other benefits associated with BOYD to an organization include: reduction on capital expenditure (94.3%), reduction in maintenance costs (97.3%), increased revenues due to the minimized need for re-orders for new equipments (91.8%), decreased operating costs (91.9%), reduced time and cost of training employees on device utilization (90.5%). One manager indicated that the concept is cost effective, saves time and enhances better work performance. This is because an employee is able work efficiently from anywhere at any time. One is also able to promptly respond to customers. With BYOD, less paper is used, approvals and escalations are done promptly, and we are able to leverage on the existing facilities. Members of staff are also able to share the best devices and applications at the work place and are able to choose their own devices (Manager I, 2012)

Challenges Faced in the Adoption of BYOD Concept

BYOD is a new concept in developing world. Effective implementation of BYOD concept is as such marred with a number of challenges. This study intended to explore the likely challenges faced by organizations in the adoption of BYOD concept. The major challenges identified by the respondents include: compromising on company's privacy by workers 86.5%, deviate from their core business 86.3%, and "off the clock" work that could either increase overtime expenses or the risk of off day claims 73 %. Other challenges identified include: breach of security, increased cost of training employees on how to use their own devices for official duties, loss of time due to configuration and specifications of some devices which may be complicated, controlling the organizations' contents to ensure confidential of the data, employees demanding compensation of any device lost or data, incompatibility with some applications and licensing challenge, lack of a uniform/standard computing platform, management of information flow and storage may be challenging and lack of guidelines on the use BYOD.

Key aspects of 'Bring Your Own Device'

The respondents were asked to identify the various aspects of BYOD concept that were enforceable in the organization adopting concept. The following aspects were considered critical in evaluating a device to be used within an organization Privacy (71.6%), Reliability (60.8%), Sustainability (51.4%), Device model and type (45.9%) and User device experience (37.8%).

The identified aspects were largely affected by the existing policies supporting the available infrastructure. 65% of the respondents noted that organizations had policies that establish the aspects for BOYD concept but the policies are not well structured so as to be effective with only 48% agreeing that the policies are effective. Hence the need for development of a BOYD adoption Model.

Proposed Hybrid BYOD Adoption Model

Considering the challenges organizations faces in adopting BOYD, this study proposes a hybrid model to guide in the adoption of BYOD concept by an organization. The proposed model borrows some characteristics of the existing models viz integrated Model of BOYD and Specific Functionality Model of BOYD. The proposed model also extends the proposition for the integration of organizational infrastructure which was omitted from the previous BOYD adoption models MobileIron (2011).

Based on the findings of this study, the model for the organizations in Kenya is the Hybrid Model which takes in the aspects of standardization and flexibility. The proposed model is based on the following key aspects: technical consideration, training consideration, content, liability, sustainability, device choice, affordability and user privacy components. Figure 2 diagrammatically presents the proposed Hybrid BYOD Model.

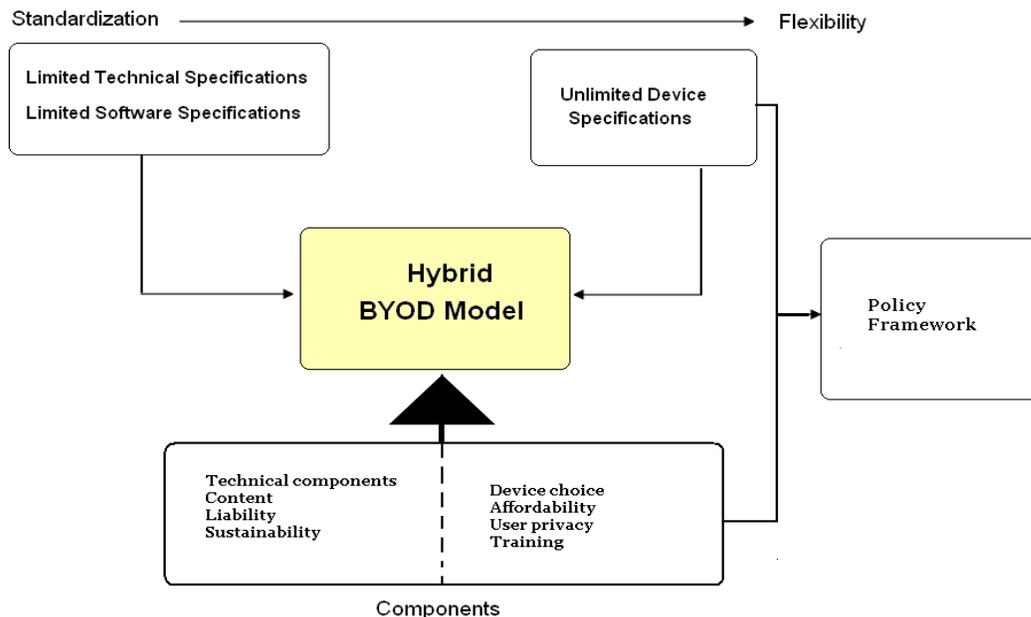


Figure 2: Proposed Hybrid BYOD Model

The standardized and flexible aspects considered in the model are more accommodative on the part of the users (employees) and the organizations. These standardized components include technical (hardware), content, liability and sustainability aspects. Different organization will however find it convenient if developing a matrix to measure the standardization components due to the inherent difference in organizational orientations.

The flexible components allow the user to make his/her own choice of device to use, based on the affordability, privacy and level of training on the use of device functionalities. The arrow, starting from standardization to flexibility shows the openness of the model which takes into account rigid aspect and flexible aspects of BYOD too.

The policy framework in the model is guided not only by standardization and flexibility aspects but also the device components. The policy framework serves as an answer to some of the key challenges that are likely to sprout from the standardization and flexibility aspects along with device components requirements.

Conclusions and Recommendations

From the findings, it can be deduced that the key benefits that organizations may find through the adoption of Hybrid BYOD Model include but may be not limited to enhanced flexibility, job collaboration, performance enhancement, job satisfaction and organizational productivity. In terms of policies and benefits, it may further be concluded that own device policies available leads to better alignment of the corporate objectives, leads to increased visibility of the facilities portfolio in the organization and leads to decreased operating costs to manage existing facilities.

The key challenge experienced by companies as they try to adopt BYOD concept is a policy issue. There are certain organizational policies that affect negatively the full adoption of Hybrid BYOD Model in the organization. These policies are not structured so as to allow for the adoption of BOYD concept. Other challenges include losing control in managing the organizations' information and data, employees being likely to engage in "off the clock" work that could either increase overtime expenses or the risk of off day claims and employees easily deviating from their core business for example through access to sites that could otherwise be prohibited.

Privacy, reliability of the devices, device sustainability in handling organizational tasks and the type and model of device required were found to be the critical aspects in evaluating a device to be considered in the BOYD concept within an organization. Infrastructural aspects could also led to successful integration of BYOD concept in an organization.

The proposed hybrid model bears both standardized and flexible aspects of personal device. The benefits of the standardized aspects lie in the control that organization may have on the personal devices. On the other hand, the flexibility aspects bring about the openness of the devices that

employees may wish to use in the organization. The challenges likely to be faced in the adoption of hybrid model lies in the standardization aspect where the users may not be comfortable with the standards set by the organization. The challenges may also be associated with the device components framework. However, the challenges are mitigated by the policy framework guiding the standardization of personal device components.

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