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Bring Your Own Device (BYOD) in Higher Education: Opportunities and Challenges

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Abstract: *Consumerization of IT or Bring Your Own Device (BYOD) concept is spreading very quickly in the organizations which hugely depend on IT infrastructure and need their employees connected to the organizations computer network for most of their tasks. Simply stating, BYOD means allowing employees to access organization network via their own devices/technology. This has resulted in enhancing ease of work in employees and is contributing in enhanced productivity. Among a lot of challenges, security is the important factor. Also, employers have to decide on working hours and payment procedures accordingly. This paper gives a short introduction to the various advantages and issues involved in general. The paper is mainly focused on how BYOD concept can be helpful in education sector, especially in higher education.*

Personal devices coming into the workplace are broad and diverse- so there is a challenge for companies to carefully device their BYOD policies and BYOD management systems. BYOD has small investment cost but longtime operational cost. A lot of important factors have to be considered while implementing BYOD policy either at workplace or at education institutes.

BYOD may change the concept of computer or internet lab. This concept has its own advantages and challenges which are discussed below. According to a survey for educational institutes in US and UK, 85% of institutes allow students and staff to access the school network. It is also found that personal devices are mostly used as much for educational purposes as for private purposes

There are also a lot of BYOD policies available for organizations as well as educational institutes. Most of the educational institutes have allowed some form of BYOD onto their campus mostly via network access control (NAC) without implementing any BYOD policy. This may expose institutes to various risks therefore a well documented BYOD policy is essential.

Keywords: Consumerization of IT, BYOD, BYOD in Education, Mobile Device Management (MDM)

1. INTRODUCTION

Bring Your Own Device or BYOD is a strategy proposed by Intel's chief security and privacy officer Malcolm Harkins in 2009[1]. After observing that most of the employees bring their own smart phones tablets and mobile storage devices on the job, rather than getting concerned about loss of enterprise data security and employee productivity, he proposed a policy to embrace this trend and use it as a means of cost cutting and improved productivity.

2. DEFINITION OF BYOD:

BYOD is a concept that allows employees to utilize their personally-owned technology, devices to stay connected to, access data from, or complete tasks for their organizations. At a minimum, BYOD programs allow users to access employer-provided services and/or data on their personal tablets/ e-Readers, smart phones, and other devices [2].

Intel has achieved better productivity improved security and greater control. It is expected that by 2014, 70% of the Intel's employees will be using their own devices at workplace

One of the arguments in favor of BYOD is that it is an attempt to effectively utilize the resources. Office computers remain unutilized when office hours are over. Similarly certain colleges don't allow their students to use their devices in the campus premises, most often requesting to switch them off.

This idea, also called as consumerization of IT, got widely accepted and adopted by both employers and employees. Employers were considering it as an efficient means of cost cutting in organization IT infrastructure and equipment. For employees this idea is attractive as it provides an enhanced level of comfort in using a technology of their own choice to do office work. In January 2012, Avanade released the results of a survey of more than 600 business and IT leaders in 17 countries that has contradicted common myths about factors driving the Consumerization of IT. The study, "Dispelling 6 Myths of Consumerization of IT" [3], indicates a fast-moving shift in the use of consumer technologies in the workplace and a surprising level of investment in this trend by IT employers. Following is the brief summary of this report about assumptions and fact about consumerization of IT

- Enterprises are not resisting but rather embracing this change
- Companies are investing in staff and resources to enable this change
- It is also a fact that allowing personal technologies in the workplace is not a recruitment or retention tool particularly among younger employees
- When employees bring their personal devices at workplace, they use it to access enterprise applications like CRM, ERP etc rather than checking emails and face book updates
- Personal devices coming into the workplace are broad

and diverse- so there is a challenge for companies to carefully device their BYOD policies and BYOD management systems.

- Finally and most importantly majority of companies have already encountered a security breach as a result of consumerization of IT

BYOD has small investment cost but longtime operational cost. The BYOD does not mean mere permission to employees to use their personal devices or technologies to access sensitive enterprise resources, it also means that employer should provide a proper infrastructure to incorporate efficient working and communication among various types of devices and technologies on enterprise IT infrastructure. There are a lot of issues needed to be resolved for this purpose. You must take care of various technical, legal, financial and other aspects. Following are some of them

First of all, it is a general observation that devices possessed by individuals are more up-to-date than the device owned by organization. They vary in type, technology and a lot of other factors depending on users own comfort in using a device. Accordingly organization's technical infrastructure must be sound enough to support this diversity.

Personal devices contain their own data like photos, videos, favorite books, data about the articles books and blogs they are working on etc. When connected to organization's server these data is accessible to employer. Privacy of such data must be maintained. Issues regarding loss of such personal data have to be addressed properly.

Loss of employer's sensitive data is also a critical issue. What if a worker sells out its device or leaves the organization or shares his/her device with relatives or friends.

Further, employer can track out employee's behavior, likes dislikes from the information stored on personal devices, locate his/her whereabouts using GPRS locator and such other apps. That can be used against employee.

Personal devices also have certain software and programs use of which may be not allowed within an organization. So, employees must be educated properly.

If employees are connected to organization's network via their personal devices, they can work from anywhere, even in holidays. Calculating working hours and payments become a difficult problem in such cases

Some employers consider costs and risks of employees getting hurt on the job. They may offer solutions in the form of insurance, safety training and other available alternatives. Repetitive stress injuries of deskbound employees can also be covered in this. What if such injuries occur to an employee while he/she is doing office work on his/her own device?

So, an organization adopting BYOD must have a sound BYOD policy. This is implemented using any suitable of Mobile Device Management (MDM) application. There are a lot of MDM policy providers in the market;

AirWatch has emerged as a leader. MobileIron, Citrix, Good Technology are few others [4].

It is also essential that employers organize training sessions to properly educated employees regarding advantages and issues that can be faced by them while adopting for BYOD.

According to a global survey done by OVUM [5], percentage of BYOD acceptance for India is more than 80% and implementation of BYOD policy for India is around 40%. Where as in US, percentage of BYOD acceptance is 40% and implementation of BYOD policy is around 30%. This survey shows that lack of efficient BYOD policy is an issue everywhere. It is also interesting to note that India shows a higher percentage of acceptances for BYOD and BYOD policy implementation when compared with both growth and mature markets.

3. BYOD IN EDUCATION:

Although not as a specific concept but since almost one decade educational institutes are observing tendency of students and teachers to bring their laptops, smart phones and tablets as a resource for enhancing their learning experience.

According to Tom Murphy of Bradford Networks, "Education institutions have been at the forefront of the BYOD trend for years and in many ways provide a road map for enterprise organizations that are just starting to embrace freedom of device choice for their employees." [6]

Below is the global picture of mobile device ownership by students [7]

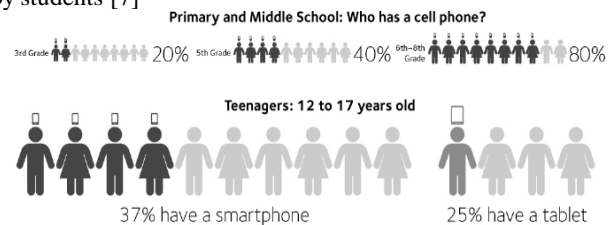


Figure 1 Percentage of mobile device owned by students and teenagers

According to a survey conducted by Educause, most college and university students (86%) own laptops as their primary computer device for academic purposes, but more students in 2012 than in previous years owned tablets (15%), smart phones (62%) and/or e-readers (12%) [8]. Another survey by Bradford Networks for educational institutes in US and UK [9] found that 85% of institutes allow students and staff to access the school network. This is higher in higher education (89%) and lower in K-12 (primary plus secondary education in the UK) where it is just 44%. It is also found that personal devices are mostly used as much for educational purposes as for private purposes: 78% said that the devices are used in their school systems "for personal use by teachers and

students,” while 72% stated that students used the devices to complete class assignments. These surveys clearly reflect a wide acceptance of BYOD in education.

The reasons behind these levels of acceptance may be that the very purpose of any education is to provide knowledge which is achieved by providing more and more information about particular subject. Contrary to IT organizations, where data and information is sensitive in nature and may not be allowed to access from outside or by some unauthorized person.

Today internet is the major source where information is available in abundance on any subject in the form of eBooks, blogs, forums and a lot other web based resources. Institute may have subscription to e journal and e Libraries which again most of them provide for free to the students .With BYOD Students can access them from anywhere easily. Teachers can share their knowledge easily with students in or out of classrooms. This concept proves beneficial to the students with all types of understanding levels. Students with high IQ level can

achieve expertise in their subject of interest in relatively small period of time. Introvert students who hesitate to present their doubts in classroom can email or post their doubts either to his/her teacher or in any online forum.

Like for Industry, there are also a lot of BYOD policies available for educational institutes. These policies are provided by market leaders like CISCO and others which can be relied upon [10]. Also, there are a lot of education guidance providers who have chalked out guidelines on how to make an educational institute BYOD supported. Following is the layout provided by Weebly for schools. [11]

Most of the educational institutes have allowed some form of BYOD onto their campus mostly via network access control (NAC) without implementing any BYOD policy. This is very risky as institutes are exposing their networks to various threats like unauthorized access, attacks of malware and viruses from student devices connected to institute network, loss of data etc.

	Action		Resource
RESEARCH	Step 1	<ul style="list-style-type: none"> Build a small BYOD research team. 	Colleagues who are interested
	Step 2	<ul style="list-style-type: none"> Research what BYOD is, what it looks like in the classroom and what the issues are. How have others schools implemented it? What were there challenges? Which model of BYOD are schools using? 	DEC 2013 Literature Review Internet research Twitter #nswdecbyod or #BYOD or #BYOT search
CONSULTATION	Step 3	<ul style="list-style-type: none"> Survey for attitudes/type and quantity of devices Develop own survey instrument or use all or part of existing survey tools Interpret the data Clarify the next steps, if BYOD is going ahead 	Survey to key stakeholders: <ul style="list-style-type: none"> ✓ Staff ✓ Students ✓ parents/caregivers
	Step 4	<ul style="list-style-type: none"> Hold a school staff meeting, P&C meeting, parent/caregiver/student forum after the surveys have been analysed 	Present findings and conclusions to date.
POLICY DEVELOPMENT	Step 5	<ul style="list-style-type: none"> Form a BYOD interest group 	Representation from executive, staff, parents/caregivers (P&C) and, if appropriate, students (SRC for example)
	Step 6	<ul style="list-style-type: none"> Develop a draft BYOD policy for the school 	DEC 2013 Literature Review Other school policy documents
	Step 7	<ul style="list-style-type: none"> Circulate the draft school policy for comment by the school community 	Feedback form
	Step 8	<ul style="list-style-type: none"> Develop the final version of the policy 	BYOD interest group Advice from feedback form
	Step 9	<ul style="list-style-type: none"> Communicate the school’s BYOD policy to the school community 	BYOD policy document and accompanying letter

FIGURE 2 A Byod Policy Guideline for Schools

Now as BYOD is emerging as an independent concept, it will become essential for educational institutes to understand what exactly is needed to be done when they decide to BYOD their network.

When cornered about younger generation, the very essential challenge will be concerned that institute resources should not be used for juvenile purpose. Access to various resources should abide by the national and international laws and regulating policies.

Further government education regulating authorities should play an important role in designing such policies. For professional education, such authorities provide specific norms regarding IT infrastructure and institutes must abide to them. BYOD may change the concept of computer lab.

Same will be the challenge for institutes running IT related courses. Institutes have to subscribe various programming and development software and applications for teaching purpose and deal with licensing. Although IT industry provides educational licensing for such software but now they must consider BYOD aspects of these licensing.

From the beginning while proposing the BYOD, Intel has accepted that it will be one of the cost cutting strategies. While adopting such strategies in education, we will be facing a lot of issues. In countries like India, students may get reluctant for institute not providing IT infrastructure. A solution of such problem can be given by providing financial assistance from the cost cutting obtained via BYOD. Institutes may support eligible students in procuring educational resources or provide such other suitable financial support.

4. CONCLUSION:

While a person is at work or at school, a computer may be laying unused back at his/her home, a switched off i-phone in the pocket. Similarly, after schools are closed and office hours are over, the computer labs there are remaining unused for more than 8 hours. According to Professor Stephen Heppell, University of Bournemouth "Every turned off device is a turned off child" So, BYOD is an effort to better utilize available resources. It cannot be denied that BYOD is a cost cutting strategy of organizations, yet the level of its acceptance by workers is very high. For educational institutes, BYOD has its existence in some form or other since more than a decade. The only need for them is to have a well stated and organized policy. Government authorities and IT industries may support educational institutes in this. The ultimate goal should be to provide enhanced learning resources to the students within their comfort zone.

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