

Is ‘Enterprise Mobility’ The Way Forward For Enterprises? Part I: Findings and Implications from Longitudinal Analysis and Systematic Review

Pradeep Singh¹, Naveen Pandey²

¹Research Analyst, Current Analysis Group, Global Data Research Center, India

²Assistant Professor, Department of Decision Sciences, University of Petroleum & Energy Studies, India

ABSTRACT

Attracted by the benefits offered by mobility technologies directly relating to cost savings and improved productivity, enterprises are keen to adopt BYOD models; however, without proper feasibility studies and mobility policies in place, BYOD will not be able to generate the desired results. The commercialization of technology or BYOD is rapidly transforming the enterprise mobility landscape and changing the way that organizations conduct business. However, the adoption of this concept enables enterprises to devise stringent and precise mobility policies to avoid any security and privacy issues.

Keywords: Business Value, BYOD, COPE, CYOD, Enterprises, IT Services, MDM, Mobility, SMEs

I. INTRODUCTION

In order to improve productivity and employee satisfaction, many enterprises have adopted the BYOD model. Employees are looking to adopt various mobile devices, primarily smartphones and tablets, to replace traditional desktops and laptops and improve their accessibility to enterprise data, irrespective of the place and time. Moreover, enterprises are also looking to adopt other variants of the BYOD model such as Corporate Owned Personally Enabled (COPE) and Chose Your Own Device (CYOD) models. Under the CYOD model, employees can choose from a limited number of approved platforms or devices, while the COPE concept provides more flexibility, enabling employees to use any device; while usage, support costs and many other areas are controlled by the organization. Although the BYOD model has created new opportunities for enterprises to reduce their hardware purchase costs, while boosting productivity and operational efficiency, it has also enhanced the risk of data leakage and created new challenges for IT departments to manage various mobile devices and platforms.

As a consequence, CIOs and IT departments need to be vigilant and make sure that they do not adopt this model without proper feasibility studies as it can lead to serious data security issues and management headaches. Organizations are required to devise stringent and focused mobility policies to help leverage the benefits of BYOD models and reduce the risk of any security threats and data leakage (Scarpino 2011; Barnes 2008). The below mentioned Table (1) and

Fig (1) illustrates the number of medium-sized enterprises responded for ICT survey.

Table 1: Medium-sized enterprises ICT survey data geographic breakdown

Countries	Count
Germany	79
UK	74
US	72
Russia	65
Italy	61
China	59
India	57
Spain	52
Brazil	51
France	44
Canada	44
Australia	42
Others	321

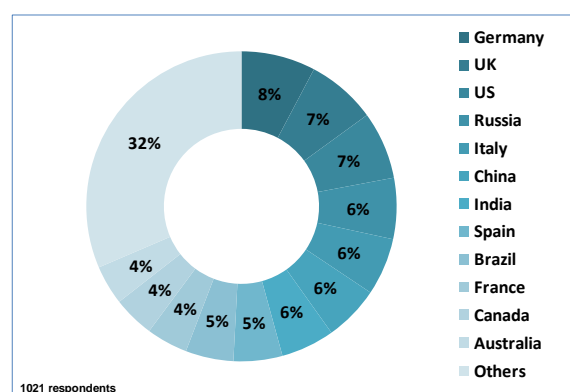


Fig.1. Medium-sized enterprises' ICT survey data geographic breakdown

ENTERPRISES TAKEOUTS

Enterprises: the adoption of mobile device/application management solutions and regular upgrades to mobile operating systems.

IT departments: need to provide separate keys and increased containerization.

Employees: need to understand the pros and cons of BYOD policies and behave accordingly.

The below mentioned Fig (2) shows the overall ICT budget change pattern (flat, growth or shrink) from FY 2013-14 to FY 2014-15.

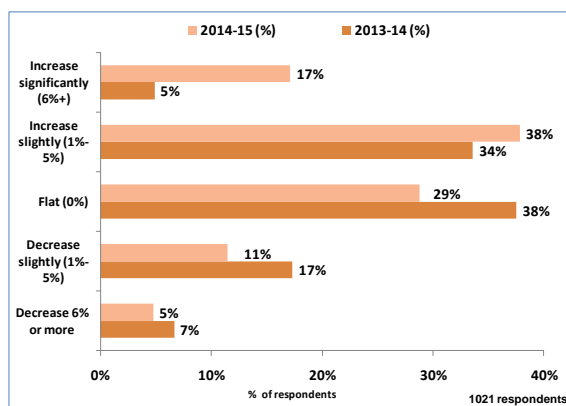


Fig.2. ICT budget change (growth or shrink) from 2013-14 to 2014-15

II. SUPPORTING ARGUMENTS AND EMPIRICAL EVIDENCES

1.1 DUAL-PERSONA SOLUTIONS HELP REALIZE BYOD BENEFITS

IT teams are continuously struggling to find the ideal way to offer secure access to employees while protecting corporate data and maintaining employee privacy. Previously, one of the solutions to the problem was to deploy full device management and security protection to employee-owned devices. However, mobile device management (MDM) mechanisms turned out to be burdensome for the IT team as well as unsatisfactory for employees. Following this, the approach of containerization emerged as a complement to existing MDM solutions to manage corporate-owned devices. This solution allows the IT team to authorize which employees may have access to business data. Subsequently, a third solution has emerged, which allows employees to separate personal and work applications on their device through dual-persona solutions. These solutions provide more power, choice and convenience to employees while protecting corporate resources (Basole 2008).

1.2 ENTERPRISES MUST ADDRESS CHALLENGES UNDERLYING THE BYOD AND BYOIoT TRENDS

Despite the obvious advantages, the concerns that businesses face with BYOD and bring your own internet of things (BYOIoT) are that of privacy and security, along with an issue relating to oversight. For firms that permit BYOD programs, devices are considered the responsibility of both the employee and the IT department. However, if nearly every device is installed with a computerized sensor, it creates a burden for the IT personnel, which will in turn increase costs as a result of hiring new IT employees. Enterprises, however, can address some of these security concerns by assigning a unique IP address and channel access to the network through certain nodes, which will enable IT departments to match those addresses that have been approved. This way, the approval process for IP addresses can be quick, whilst being adaptable enough to change when required (Sørensen 2012).

1.3 SMALL AND MEDIUM-SIZED BUSINESSES CAN HAVE A HASSLE-FREE BYOD EXPERIENCE

With BYOD becoming a growing reality, small and medium-sized businesses need to be swift in embracing it; however they should first design BYOD policies, which must be precisely written and explained to employees. In addition, business managers need to ensure that the essential tools are available on as many platforms as possible so that staff can access relevant information (Bellavista, ac, If 2009). Furthermore, beyond setting up email services, small and medium-sized businesses can take two approaches to deliver individual apps: they can use specific native apps designed for the device; and resources can be accessed through a browser-based interface.

1.4 HELP-DESK TECHNICIANS MUST BE PREPARED FOR THE BYOD CULTURE

With the adoption of BYOD removing restrictions on using applications and hardware devices, help-desk technicians are being impacted in several ways. First, BYOD can cause new IT issues such as bandwidth hogging, aside from the inaccessibility of shared devices and network connectivity, which will result in a surge in ticket count. Therefore, it is essential to ensure that there are enough help desk technicians to handle increasing numbers of tickets. Secondly, due to BYOD, help desk technicians will have to deal with several applications or hardware, many of which they may not be familiar with. Therefore, technicians will have to improve their skill sets. Thirdly, help-desk technicians should learn to draw the line when devices are used for personal

purposes. It is essential for enterprises to prepare their help desk engineers and technicians for the BYOD revolution (Scornavacca 2008).

The below mentioned Table (2) and Fig (3) illustrates the number of medium-sized enterprises responded for ICT survey across the industry verticals. The respondent size for manufacturing counts for 101, similarly respondent size for healthcare counts for 87.

Table 2: Medium-sized enterprises' ICT survey data industry breakdown

Industry	Count
Manufacturing	101
Telco/service provider	93
Energy	90
Healthcare	87
Government	84
Financial markets	81
Retail	75
Insurance	72
Retail banking	71
Utilities	70
Pharmaceuticals	67
Education	64
Media	56

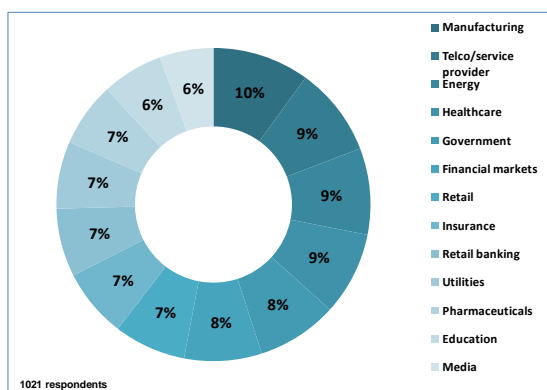


Fig.3. Medium-sized enterprises' ICT survey data industry breakdown

III. KEY ACTIONS BEFORE THE ADOPTION OF BYOD MODEL

1.0 ENTERPRISES SHOULD CAUTIOUSLY EMBRACE BYOD

In the wake of the surging BYOD trend, firms need to follow certain tips to benefit the most from their MDM initiatives.

Firstly, with employees using cloud storage applications such as Dropbox, firms face a bigger threat of data leaks. To ensure that personal and corporate data are not mixed and shared, businesses can use mobile device management solutions. These can restrict access when employees are connected to corporate networks, but allow them only for personal use.

Secondly, as BYOD and mobile device management are widely accepted in some countries and not in others, companies need to embrace different mobile device and BYOD policies for different markets.

Thirdly, one way to keep mobile devices secure is to ensure that they are updated with the latest version of the iOS or Android operating system along with the required security bug fixes. However, as companies cannot force employees to spend money on upgrading their mobile devices, the former ought to have an approved list of devices for corporate network access as part of their BYOD policies.

The below mentioned Fig (4) illustrates the adoption trends of the enterprise mobility technologies (Device management, Employee/supplier facing app dev, Customer facing mobile apps, Tablet computing) among medium-sized enterprises in FY 2014. The fig also shows next two year adoption pattern of these technologies respectively.

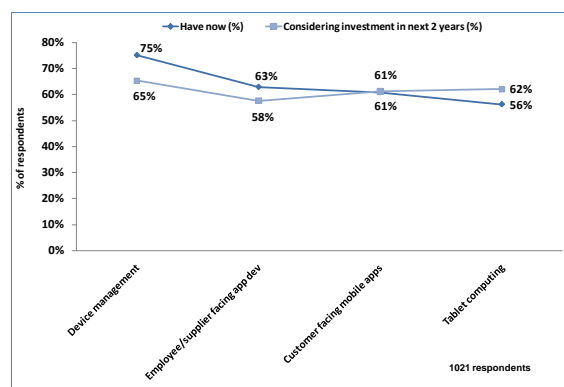


Fig.4. Enterprise mobility technologies adoption trends among medium-sized enterprises in FY 2014.

2.0 WAYS FOR THE IT DEPARTMENT TO DEAL WITH THE BYOD CHANGE

With the BYOD trend in the workplace here to stay, IT departments need to refine their procedures to adjust to the changes that come with it. Earlier, IT was focused on physical devices, especially PCs; however, the prevalence of BYOD has made things challenging for IT departments as they have to deal with several devices and platforms. With people frequently changing their tablets and smartphones, it had become difficult for IT departments to keep a track of what types of devices have been coming in and out of the offices.

However, following several refinements to existing tools and the emergence of new products and ideas – including the concept of segregating work and personal “containers” — things seem to be looking better. Moreover, by having separate “keys” for different kinds of data and access, and then handing out those keys to the appropriate people, IT

departments can focus on the aspects they specifically need to manage, whilst providing freedom to employees to use the devices of their choice (Basole 2007).

IV. RELATED WORKS

The most distinguish areas where mobility model can be helpful for start-ups:

Due to limited budgets, small and start-up firms face the hurdle of eliminating waste and finding ways to experiment and expand. However, companies will be able to make use of their limited resources with mobility technologies. With this added efficiency, businesses can increase their capital and revenues easily. There are two important areas where mobility technologies can particularly be implemented.

First, tracking customers and potential customers is very difficult for small businesses. They might invest more or less than required, both of which are not ideal for a fledgling business. This is where mobility come into use - it helps in gauging how much should be invested in marketing and where that money should be spent.

Second, mobility helps enterprises improve performance of their either already superior employees or improve the efficiency of a struggling workforce. Mobility technologies have proven that it is effective in motivating and improving employees' performance in various sectors. As a result, it enables companies to save time and money in hiring and training new employees.

V. RECOMMENDATIONS FOR ENTERPRISES TO HARNESS BYOD TREND

“BYOD’S SUCCESS DEPENDS ON A PRE-PLANNED COMPROMISE STRUCK BETWEEN EMPLOYEES AND EMPLOYERS.”

Although organizations can benefit hugely from BYOD, both employers and employees should be wary about the pitfalls. Businesses embracing BYOD should have BYOD policies that are clear and easy to understand which everyone is aware of.

On the employees' front, they need to consider whether BYOD is the right option for them or not, as their moves will be tracked constantly due to the safety measures taken by the company. Furthermore, they lose control over devices and won't be able to install the apps and games of their choice. In addition, there is every chance of their personal data being remotely wiped out if they lose their device. Moreover, it is also possible that their sensitive information might be scrutinized if the device is taken for legal examination in case of corporate litigation [7].

Therefore, it is vital that employees clearly understand BYOD and know exactly what they are

getting into. In order for BYOD to work, there has to be a pre-planned compromise between employers and employees.

The below mentioned Table (3) and Fig (4) reveals medium-sized enterprises' overall ICT budget allocation in the FY 2014 and FY 2015 (how did enterprises spend their overall ICT budget in FY 2014? How will this change in 2015?). The survey result shows that medium-sized enterprises allocated 26% and 22% of their overall ICT budget to hardware and software respectively in FY 2014, whereas medium-sized enterprises allocated 27% of their overall ICT budget to hardware segment in FY 2015, while the allocation for software segment remains the same in FY 2015.

Table 3: Medium-sized enterprises' (external) ICT budget allocation, 2014 and 2015

Category	2014	2015
Hardware	26%	27%
Software	22%	22%
Services	17%	16%
Communications	15%	15%
Consulting	12%	12%
Other	8%	8%

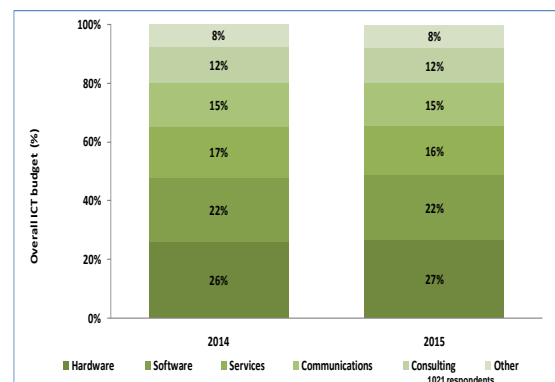


Fig.4. Medium-sized enterprises' ICT budget change from 2014 to 2015

VI. ISSUES AND CHALLENGES

1.0 ORGANIZATIONS NEED TO OVERCOME THE SECURITY CHALLENGES OF MOBILITY

“It is expected that enterprises will be significantly shifting their focus from web to mobile and leveraging apps to increase revenue and productivity.”

According to a survey, 77% of executives at organizations rank mobility highly. Therefore, firms thinking of embracing mobility must change their fundamental business processes.

- To stay in touch with this evolution, traditional boundaries of ERP systems must be eliminated. Only then can enterprises gather insight and information, and perform analytics and

intelligence across different parts of the enterprise.

- Enterprises can tap new ERP solutions to work along a new value-based dimension, which is collective of content, context, data and analytics.
- Furthermore, in order to be competitive, mobile apps must be able to respond to user requests within the shortest time. The apps will therefore, be judged on their uptime and responsiveness [8-10].

The below mentioned Table (4) and Fig (5) illustrates various factors influencing medium-sized enterprises' decision to choose an IT provider in FY 2014. Various factors such as geographical reach, contract flexibility, financing options payment terms, expertise in industry and many others have been rated by respondents on a scale of one to four and shown below.

Table 4: Factors influencing Medium-sized enterprises' decision to choose an IT provider

Factors	Average rating (On a scale of one to four)
Geographical reach	2.7
Financing options/payment terms	2.7
Contract flexibility	2.8
Breadth of solution offerings	3.0
Price	3.0
Financial stability	3.0
Expertise in your industry	3.0
Specific functionality expertise/depth	3.0
Leading-edge technology	3.1

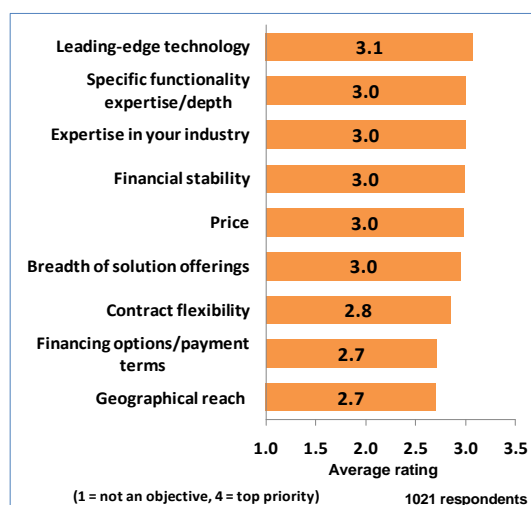


Fig.5. Factors influencing Medium-sized enterprises' decision to chose an IT provider

2.0 IMPORTANT THINGS SMALL AND MEDIUM-SIZED BUSINESSES SHOULD KNOW ABOUT BYOD

“Small and medium-sized businesses either contemplating or having just implemented BYOD policies should keep in mind a few things relating to BYOD policies, employee satisfaction, and security.”

Many large corporations are keen to adopt the BYOD model as part of their operations, but the most significant growth is being seen among small and medium-sized businesses.

- BYOD policies differ based on the business goals, available resources and IT department; therefore, small and medium-sized enterprises need to understand that what works for one organization may not work for the other.
- Given the security concerns that come with BYOD, businesses that are aware of the potential issues with this model, will be in better position to deal with them [11, 12].

3.0 THE HIDDEN COSTS OF THE BYOD PROGRAM

“Though the concept of BYOD is considered to increase employee productivity and reduce IT costs, there are concerns that it does not offer the savings the hype suggests.”

Employees purchase their devices and bear the costs of upgrading them over time. Ideally in such a scenario, organizations are expected to achieve cost savings as these expenses are paid by employees. However, the monthly service payment borne by companies can exceed an employee's expenditure for the device, thereby making it one of the largest hidden costs [13].

1. BYOD makes it difficult for companies to manage the mobile device fleet and this might result in either one of two scenarios:
 - a. The company could decide to purchase a high-end mobile device management (MDM) suite that can control their devices and protect their system.
 - b. The company can miss out on the heightened device management solution and put itself at an increased risk of attack
2. Mid-size businesses can take advantage of BYOD as they are large enough to require a company-wide mobility solution and yet small enough to benefit from the flexibility that the concept offers.
3. When opting for the program, IT managers need to have an appropriate outlook and ensure that the program is measured on its merits rather than on inflated promises [14, 15].

4.0 MOST COMMON MISTAKES IN DESIGNING A BYOD STRATEGY

“BYOD offers several benefits to businesses if it is correctly implemented. However, there are several firms whose enterprise mobility strategies are not protective or conducive to boost productivity.”

While developing a BYOD strategy, companies need to be flexible, and should not be completely inclined towards the IT department overlooking the perspective of employees. While developing a BYOD strategy, companies ought to avoid making these three mistakes [16].

1. BYOD policy should never be based on existing strategies. The idea of building a BYOD strategy is that it should enable firms to improve their processes.
2. BYOD policy is usually tilted to one side, but ideally enterprise mobility programs must create equilibrium between employees and IT departments.
3. The most common mistake is that firms usually opt for a ‘one-size-fits-all’ BYOD strategy. However, every firm has its own unique needs, and BYOD strategy can be successful only if it can connect the organization’s goals with employee productivity.

VII. CONCLUSIONS AND FUTURE RESEARCH

“Enterprise mobility is the way forward for enterprises.”

In summary, the proposed paper analyzes the development related to enterprise mobility technologies and adoption of enterprise mobility technologies in large, small and medium-sized enterprises. The paper represents a holistic view about the benefits and challenges associated in direct and cross-platform application of enterprise mobility technologies across all sizes of enterprises. However, in future it is expected that more attention would be made towards developing cross-platform interoperability of enterprise mobility technologies in such a manner that it facilitate enterprises to gain maximum leverage of enterprise mobility technologies in their business operations.

REFERENCES

- [1] J. Scarpino, An analysis of an enterprise mobility software company – managing software quality and maintaining a competitive edge in fluctuating periods of corporate growth: a case study, *Issues in Information Systems*, XII (1), 2011, pp. 7-15.
- [2] S. J. Barnes, Enterprise mobility: concept and examples, *International Journal of Mobile Communications*, Vol. 1(4), 2008. **Big C**
- [3] Basole, Rahul C., Enterprise mobility: Researching a new paradigm, *Information Knowledge Systems Management*, Vol. 7 (1,2), 2008, pp. 1-7.
- [4] Sørensen, C.: Enterprise Mobility. To appear as Chapter 60 in *The Computing Handbook Set – Information Systems and Information Technology*, ed. H. Topi, Vol. 2, 2012, CRC Press.
- [5] P. Bellavista, A. Corradi, L. Foschini, IMS-based presence service with enhanced scalability and guaranteed QoS for interdomain enterprise mobility, *IEEE Wireless Communications*, Vol. 16 (3), 2009.
- [6] Scornavacca, Eusebio, Barnes, Stuart J., The strategic value of enterprise mobility: Case study insights, *Information Knowledge Systems Management*, Vol. 7(1, 2), 2008, pp. 227-241.
- [7] Basole, Rahul, Strategic Planning for Enterprise Mobility: A Readiness-Centric Approach, *Proceedings of Americas Conference on Information Systems AMCIS*, 2007, Paper491.
- [8] Help desks critical to BYOD efforts, Website: <http://www.networkworld.com/article/218496/5/tech-primers/help-desks-critical-to-byod-efforts.html>
- [9] The BYOD Revolution, Website: <http://nexusit.ca/2015/the-byod-revolution/>
- [10] Bring Your Own Device, Website: <https://www.whitehouse.gov/digitalgov/bring-your-own-device>
- [11] ITIL® 2015 and Beyond: Six Trends Driving the Increased Importance of the Service Desk, Website: http://www.optimalconnections.com/downloads/WP_PM_ITIL_final.pdf
- [12] From Work PCs to BYOD: The Evolving Job of the Desktop Support Professional, Website: <https://www.roberthalf.com/technology/blog/from-work-pcs-to-byod-the-evolving-job-of-the-desktop-support-professional>
- [13] Secure Mobile Browsing & Custom Apps Highlight Q1 2014 Mobility Index Report Findings, Website: <https://community.good.com/community/blogs/blog/2014/05/14/secure-mobile-browsing-custom-apps-highlight-q1-2014-mobility-index-report-findings>
- [14] So you think you are BYOD-ready? Think again!, Websites: <https://community.good.com/community/blogs/blog/2014/05/01/so-you-think-you-are-byod-ready-think-again>
- [15] Advancing Growth in New and Emerging Markets through IT, Website: <https://technet.microsoft.com/en-us/dn760894>

- [16] Helping to COPE with Enterprise Mobility, Website:
<http://www.digitalistmag.com/technologies/mobile-applications/2012/02/14/helping-to-cope-with-enterprise-mobility-094>

ABOUT THE AUTHORS

Pradeep Narayan Singh is an illustrator and author,



started his career writing for white papers, conference papers, and research reports. At present he is working as “Research Analyst” at Current Analysis Group, Global Data Research Center, Hyderabad, India. He has written about latest

technological advancement in data center, to upcoming technologies in Telecom and IT. He has experience in Research and Analysis (Qualitative and Quantitative) for Telecom and IT industry. This is where; he proposes strong acumen towards the technology and related aspects and continuously looks forward to the changing technology and business aspects. He has completed B.Tech in Computer Science & Engineering from G.B. Technical University, India and MBA in Management Information Systems from University of Petroleum & Energy Studies, India.

Naveen Chandra Pandey is an “Assistant



Professor” at the Department of Decision Sciences, University of Petroleum & Energy Studies, India. He has extensive experience in industry as well as in academics; his research areas include Project Management, IT

Applications and Management Information Systems. He has completed B.Tech in Mechanical Engineering, from Kamala Nehru Institute of Technology, Sultanpur, India and MBA in Information Systems Management, from University of Petroleum & Energy Studies, India. At present he is pursuing Ph.D, from University of Petroleum & Energy Studies, India.