The impact of Bring-your-own-device on work practices in the financial sector

Information Systems Dissertation Submission

Research presented by Palesa Mphahlele to the

Department of Information Systems

University of Cape Town

17 May 2016

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Abstract

Bring-your-own-device (BYOD) refers to the practice of allowing the employees of an organisation to use their own computers, smartphones, or other devices for work purposes. This has brought a tremendous change in today's working environment. Organisations are faced with many technology trends which have the potential to create a competitive advantage in terms of both performance and efficiency.

This paper follows a qualitative approach in which 15 interviews were conducted and a survey covering of 87 respondents was distributed. The findings show that the financial sector interprets BYOD as a strategy that can create a competitive advantage to provide benefits of increased productivity, flexibility in the workforce, more autonomy, and contribute to the cost-efficiency of the business. There was also a disregard of policy formulation for BYOD from management which created a problem as employees became despondent that their personal devices were not allowed to access the corporate network. In addition, the findings revealed that work practices have to be re-defined and policies have to be drawn up in order to protect the company's assets and to provide guidelines.

To guide the research in this emerging area, a review of several established theories that have not yet been applied to BYOD were used to form part of the proposed framework, which aims to provide a mechanism in the workplace to evaluate the impact of BYOD. This paper used exploratory analysis where six major influences of work practices were identified: 1) Change in behaviour; 2) Impact on workload; 3) Changes in motivation of individuals; 4) Re-definition of work practices; 5) Impact on overall performance; and 6) Approach required for industry. It was possible to associate them to several related constructs in IS literature which exposed possibilities for future theory-building efforts. The main influences on work practices are discussed with respect to the proposed framework.

Key words: Bring your own device, financial sector, Work practices

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List of Acronyms

BYOD – Bring-your-own-device

CoIT – Consumerisation of Information Technology

ICT – Information and Communication Technology

NWW – New Ways of Working

HIWP – High Involvement Work Practices

IT – Information Technology

FInTechs- Financial Technology

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Chapter One: Introduction

Bring-your-own-device (BYOD) stems from the Consumerisation of Information Technology (CoIT) which has been around since at least 2005 when it was announced that was "the most significant trend affecting Information Technology in the next 10 years" (Garther, 2012). Gartner traced the trend to the dot-com collapse, when enterprise IT budgets shrank and many IT vendors shifted focus to the potentially bigger consumer Information Technology markets. The result has been a change in the way technology enters the marketplace. Instead of new technology flowing down from business to the consumer, as it did in the desktop computer era, the flow has reversed and the consumer market often gets new technology before it enters the enterprise (Garther, 2012). The phenomenon of CoIT is that privately owned IT is used for both business purposes in addition to being used for its original private purposes (Niehaves & Ortbach, 2012).

The new generation of information workers is increasingly getting more technology-savvy. Globally professionals today, own a smartphone, a laptop, a tablet or a PC that can do more than the average office PC (Hommel , 2013). This generation of professionals, also known as the millennials, have migrated this trend into the workplace, driving waves of change for opportunities and potential threats for the organization. In turn it has generated workplace benefits for employees and the employer such as employee satisfaction and IT hardware cost reduction. This wave of change is known as BYOD.

BYOD is a new technology strategy in organizations where the workers are permitted to bring the devices they use in their personal space into the workplace for business use and access corporate networks (Thomson, 2012). This movement can be viewed as an extension of the phenomenon 'new ways of working' which was developed from Teleworking due to the continuing shift from blue-collar production to white-collar service activity over the last 40 years (Olson, 1984). This, coupled with the progression of information and communication technology (ICT) over the last decade, has unleashed work that was previously geographically restricted to a central workplace. Consequently, the scope for much of today's work is not location- or tool-dependant (Lupton, 2000). Work practices are changing and organizations are evolving their approach in response by changing their business process to take advantage of new trends such as BYOD (Baarne, 2010).

Virtualization, which is one of the key enablers for the BYOD, is driving change in business processes because through it, BYOD can be seen as an extension of new ways of working (NWW) which has been applied in organizations for several years. Professionals around the world are being affected by BYOD because it is rapidly transforming enterprise workspaces and giving the employee the power to work from anywhere, at any time. BYOD, has impacted the 24/7 paradigm, by blurring the lines of personal and work life by allowing both to take place anytime and anywhere. The reliance on traditional work practices by working in one environment is changing as we move into the post pc era.

The implications of new technology such as BYOD will change business and social habits in organizations. However, these benefits are not without their risks, these risks range from security concerns of the devices, support complexity due to the number of models and performance concerns for the employee.

BYOD is regarded as an enabler (Niehaves et al., 2012) for the next wave of productivity in organizations but is also associated with the necessity of enterprise information technology and process change. The other side of BYOD is seen as a threat to the enterprise due to the security implications of data leakage, data theft and regulatory compliance which need to be kept in consideration when using BYOD (Morrow, 2012).

1.1 Research problem

The BYOD trend is contributing greatly to work performance in organizations; this is seen largely through a heavy focus in literature on the impact on productivity in the workplace. Traditionally BYOD was a form of teleworking identified in the 1980s by Olson (1984);, only years after bodies of research such as Gartner recognised BYOD as ”the most significant trend affecting IT in the next 10 years” in 2005 did the research on BYOD begin. The vast amount of literature focuses on the security concerns of the devices (Sen Palash, 2012) and the support and complexities due to device models by Jaramillo et al., 2013. However, the relationship between BYOD usage, work practices and work performance especially in South Africa hasn’t been fully addressed.

BYOD is a practice that has manifested in most organizations; though few studies have looked at this phenomenon from a developing country perspective. In Tanzania a study explored the impact of BYOD practices on SME’s which showed that BYOD adoption was gaining popularity because business wants to decrease investment in organisational ICT resources (Kabanda, 2014). In Kenya a study was completed to find out how organizations can strike a balance between BYOD productivity and corporate data security which revealed that even though BYOD is a new phenomenon it has been going on for a while

informally. The problem was that management have no policies to address its usage therefore impacting productivity negatively and posing as an information security risk (Kamau, 2013).

Lastly in Nigeria a study on BYOD's background, prevalence, benefits, challenges, and possible security attacks revealed that controls are required to be in place in order to implement BYOD (Olalere, 2015). These studies all have the same commonalities which is security and productivity concerns of BYOD; however the missing piece is the ability to show the overall impact of BYOD in the workplace.

Literature about the phenomena in South Africa addressed the degree to which organizations in South Africa are embracing the BYOD. It revealed that employees have a strong awareness of the BYOD concept while the employers are reluctant to formally create BYOD organizational strategies. Which clearly highlights that due to the lack of research this phenomena's impact on the workplace is not fully understood (Twinomurinzi, 2014).

Of particular concern is the lack of research in South Africa about the impact of BYOD on work practices. This lack of research on BYOD was also recognised by Niehaves et al., (2012) who discovered that BYOD remains unclear as to the underlying forces in the workplace. This research proposes to address some of the gaps from the usage of BYOD in the workplace, with a particular focus on the impact on work practices, in order to assess the overall impact on organisations.

1.2 Objectives of the study

The objective of this research is to contribute to the body of knowledge in understanding the usage of BYOD in the workplace, with a specific focus on work practices. The intention is to focus on the financial sector of South Africa to provide a longitudinal impression of both the nature and the impacts of the phenomenon.

A second primary purpose will be to determine a framework/theory which will provide us with a platform from which to evaluate this phenomenon. Though the observations in organisations, patterns and regularities experienced though BYOD usage, the framework will provide a mechanism in which to evaluate the impact of BYOD. Therefore, the purpose of this research project is to:

- examine the impacts of BYOD usage, focusing on the work practices in the workplace largely the financial sector.

1.3 Research questions

This researcher aims to achieve this by answering the following research questions:

The main research question is:

- How does the usage of BYOD impact work practices in the South African financial sector?

The secondary research questions are:

- What are the most prominent work practices in the work place affected by BYOD?
- What is the perceived impact of BYOD implementation on employee and employer?

Thus this paper adopts an exploratory study to address the research questions. The structure of this paper is explained in the following section.

1.4 Structure of thesis

First, we present suitable background literature on the topic, discuss the multiple theories analysed to build the proposed framework. Afterwards an overview and explanation of the methodology is given, followed by the description of the study data findings and discussion, focusing on pointing out implications for theory and practice. The results will be presented with regards to limitations of our research and focus points for future research will be highlighted and discussed.

Chapter Two: Literature Review Summary

This chapter will present some of the identified gaps in current knowledge of BYOD and work practices. The overall goals of this chapter are firstly to establish the significance of the general field of study, and then identify a place where a new contribution could be made. The majority of the chapter focuses on critically evaluating the different methodologies, implementation approach and impact of BYOD in this sector so as to identify the appropriate approach for investigating the research questions.

2.1 Work practices

A work practice can be defined as a method, procedure, or rule used in a particular field, work or human activities (Muhanguzi & Kyobe, 2014). These practices are closely aligned to human resource practices in an organization; these are organizational activities directed at managing the pool of human resources and ensuring that the resources are employed towards the fulfilment of organizational goals (Tiwari, 2012). In earlier studies these practices were a contingency perspective to enable an organization to achieve its goals and higher levels of productivity through the use of resources such as Information Technology. Over time these work practices and human resources practices have evolved into high involvement work practices (HIWP). This is due to the increasing acknowledgement of employees as an organization's asset and the need to find ways to increase employee contribution to the organization (Hyman, 1995).

These practices called high involvement work practices (HIWP) and are referred to as non-traditional HR practices that have become widespread in companies (Ichiniowski et al., 1996). These are grouped into three dimensions, i.e. high relative skills requirements; jobs designed which provide opportunities to work in teams; and finally the incentive structure (Appelbaum et al., 2000). The main underlying assumption is that by management designing high commitment work practices it would enable employees to become involved and identify the goals required for them to perform.

In the present study high involvement work practices will be adopted, where work practices are considered to be a mixture of three dimensions: HRM practices, workplace collaboration, and incentive structures. This study aims to examine the impact of these practices on BYOD usage in the workplace.

2.2 Work practices in the financial sector

Literature in the financial services has a heavy focus on productivity and how to increase branch efficiency in order to bring more customers into the bank. A study based in two Bangladeshi banks discovered that work practices are the core of most business organizations in order to create greater value through better performance in the branch (Khan, 2013). Another study based on resource-based view (RBV), social exchange theory (SET), and a theory of intrinsic motivation (empowerment) tested a multi-level model that aimed to examine the intermediate linkages or mechanisms through which work practices impact individuals and organizational performance. In the study the results revealed (Seidu, 2011):

- Management rated that work practices are based on experience of systems in place
- Psychological empowerment fully mediates the influence of experienced work practices on service-oriented organisations
- Service-oriented practices mediated the influence of psychological empowerment and on service quality and task performance.

The financial sector has core functionality dealing with, among others, investments, demand deposits, savings, commercial loans, real estate loans and installments loans. This study aims to examine the impact of work practices on the operations of the sector and not specific functions. Currently Human Resources Practices (HRP) is seen as a black box in the banking industry because of the policies enforced. This has created a relationship between HRPs and the organizations where the way of working is linked to a policy. A framework developed by Appelbaum et al. (2000) states that HIWPs enable regular employees to participate in decisions and supports HRPs that enhance worker skills that provide incentives for workers. Therefore, these are grouped into three categories; opportunity to participate, human skills, and incentives contribution to the overall organizational benefits (Pate, 2004). The employees are recognized as the key contributors to the overall performance of the sector and not necessarily the service offering from the bank. The management of people and the work practices which are applied in this sector determine the success in the industry (Chakrabarty, 2012).

2.3 South African financial sector

South Africa has seen a rise in the use of smart devices, based on statistics collected in 2013-2015 that show South Africans are expected to buy more smartphones than feature phones, meaning that almost every South African in a white-collar job will bring a smartphone to work. MTN South Africa reported that 16.3 million smartphones are active on the South African networks in a population of 51.7-million; this translates to 31% penetration (Goldstuck, 2014). Therefore, the South African face of business is due to change to cater for users who are more demanding to obtain intuitive apps and instant gratification from technology. This will give employees the capabilities to work from anywhere. This trend has changed the manner in which business operates, by forcing South Arica to jump on the bandwagon and face similar challenges and opportunities as our international counterparts. The new workplace models are characterized by information finding the people, rather than people finding information. The consumer-type devices in the workplace mark a step change in the way people consume and think of business IT (Oliver, 2012).

This type of evolution will impact the financial sector greatly due to the introduction of technologies which are impacting the way of working. Financial Institutions have deep roots in traditional means of working, which also explains the manner in which this sector adopts new technologies.

The adoption rate of new technologies in South Africa is slow when compared to other developed countries. However, this industry holistically was among the earliest adopters of automated information processing due to the nature of the business (Cornelia, 2011).

The focus on this sector is due to the increase in digitisation of sectors such as retail, education and air travel industries, customers are demanding similar from other industries, including banking. The rise of FinTechs are meeting this challenge while the banks hesitate which poses a threat, because their offerings are built around optimisatoin of technology strategies and sophisticated, disruptive software. However, there is also a technological drive internally as well, with employees expecting far more from the technology they are provided with to do their jobs, and demanding the ability to use their own technology at work. Many large operations have this type of challenge due to the traditional IT departments who resist such change and are often one of the main obstacles to digitising the workplace (Austin, 2015).

Since the early 2000's South African banks have been investing into technology by integrating systems, upgrading legacy systems and implementing new technologies such as cloud and BYOD. PwC's 2015 banking survey found that the combination of technological change, regulatory challenges, and customer and social expectations is daunting, while the stakes are enormous. While global banking industry is under attack from many perspectives, not just from traditional risks but also as a consequence of new uncertainties, technology risks are increasingly becoming concerns of banks given the rise in cyber security and new competitors who are challenging traditional ways of working. Therefore increasing the need for this industry to change characterises of the current operating environment (PWC, 2016).

In a study, it was found that financial institutions that are moving away from branch centralisation to more virtual banking will require new IT applications, new managerial practices and new consumption patterns within the bank (Wood, 2002). Conversely years later it is evident that the customer wants higher quality and not quality via personalised channels, the use of BYOD will benefit both the sector and the man on the street in adopting new ways of working with technology. Hence the trends such as BYOD cannot be avoided by management. Financial institutions are now challenged to design internal systems that provide better control of the profitability drivers and which enable the organizations to capture a new synergy. The question at hand for South Africa specifically is how to implement these technology strategies, without too many disruptions.

In coming times, the very survival of the banks would depend on customer satisfaction while at the same time, technology disruption is happening outside the banking industry and at a rapid pace. For example, in critical banking dominated areas such as payments, global players including technology giants Google, Apple and Amazon are having an impact on the financial services industry and unleashing a sequence of disruptions that is likely to continue (PWC, 2015). Those who do not meet the customer expectations will find survival difficult. Therefore adoption and usage of technology trends which employees request and consumers recognise are important to consider for implementation (Raghavan, 2006).

In a report (PWC,2015) about the financial sector, it was also recognized that much is changing in the banking landscape regarding, regulation, technology, demographics, changing customer expectations, greater competition and issues with banks' own legacy business and operating models. The challenges are clear, even if the ultimate endgame is not: because of BYOD it is required for this sector to get ahead of these challenges and retool to win in 2020.

In order to be agile, innovative and adaptable and execute effectively to deal with uncertainty as the future unfolds, trends like BYOD are only the beginning of strategies or trends that will impact this sector; every bank needs to develop a strategy to tackle these challenges – a strategy that will transcend the status quo and considers all possibilities that can adapt to an uncertain future.

2.4 Bring-your-own-device

In recent years, there has been an explosion of technology that has led to the CoIT (CIO, 2011). Devices and services historically available only in the workplace and provided by IT departments are now widely available and affordable for consumers. The roots of BYOD can be traced back to the consumerization of all things 'tech', where technical wizardry is no longer purely the domain of the 'geek' who works for the IT department.

Many employees have turned into geeks, formally known as Millennials – the first generation to grow up with computers from birth. These individuals have entered the workplace with demands to make their own technology choices, whether those choices are on the 'approved' list or not and whether the company pays for it or not (Keyes, 2013).The introduction of devices such as the Apple iPhone, iPads, Google Android smartphones and tablets at lower costs, has increased consumers' appetite for the latest technology, in turn creating a need for these devices in the workplace (Slottow, 2012).

The IT departments typically lag behind the technology curve due to the effort to test new technologies, cost of procurement, and the depreciation of assets which leads to staff members taking it upon themselves to bring in their own equipment; this has resulted in the phenomenon known as BYOD.

In a study by Scarfo (2012) it was stated that BYOD is derived from several frameworks based on the state of the art of telecommunication technologies, such as label switching (Palmieri, 2005), which are emerging to address all required functions of new generation converged/unified heterogeneous and mobile networks. Other authors view BYOD as enabling chaos in an organization due to the resources required to ensure high levels of security to prevent data leakage, data theft and endless compliance issues (Thomson, 2012). A report revealed many organizations and government departments are considering rolling out the use of BYOD as an alternative to the traditional work environment (Ansaldi, 2013). This change will impact the manner in which employees currently work and also impact their personal life. Statistics collected by Gartner (2013) about the popularity of BYOD and how it has skyrocketed over the years, showed that:

- 70% of mobile professionals will conduct their work on personal smart devices by 2018
- In addition, across the United States the professions with the highest rates of personal smartphone use at work are in education (95%) and technology (90%)
- 51% of employees connect to unsecured wireless networks with their smartphones, so that security is the biggest BYOD objection worldwide, especially in the developed countries such as the USA, Germany, South Korea and Australia.

The security aspects of BYOD were seen as a concern because some of the top BYOD security issues are beyond the ability of software-management tools to handle alone. In the same survey it was found that IT department's needs to leverage software and hardware solutions to lock down and manage devices while simultaneously securing the data itself.

Furthermore, the protection of corporate data has only recently become a major concern in the information and communication technology industry due to the influx of smart-device usage. Therefore, sophisticated software enables users to manage data and carry out various tasks online. The security of corporate data on the mobile devices can only be upheld if users comply with definite security recommendations (Blaž Markelj, 2012).

2.5 Bring-your-own-device and productivity

In terms of cost saving and the increase in productivity associated with the usage of BYOD from authors (Hayes & Singh, 2013). It's not possible to implement the BYOD strategy without the support of the executives, because it needs to be driven top-down in an organisation. Gartner (2012) found that 38% of companies expect to stop providing devices to workers by 2016 and that 53% of information users use their own personal devices for work to install unsupported software, or use unsupported Internet-based services like Dropbox, Skype, Twitter, or Facebook to help them do their jobs, which can thus increase productivity but only if this is overseen and controlled.

Cisco, through its Internet Business Solutions Group (Cisco IBSG), conducted research into the financial impact of BYOD on companies (Crandal et al., 1982). The findings show that on average, BYOD is saving companies' money and helping their employees become more productive. The value companies currently derive from BYOD is dwarfed by the gains that would be possible if they were to implement

BYOD more strategically, especially in the financial sector because BYOD is only implemented to certain groups or individuals. It is not applied enterprise-wide, which limits the benefits of productivity and cost saving.

The implementation and usage of BYOD to be successful is based on the overall implementation approach followed. According to Cisco IBSG, the true value BYOD largely depends on the model an organization decides to use (Crandal et al., 1982). In the study, Cisco identifies two scenarios of BYOD usage which include:

- The basic BYOD is the way BYOD is typically implemented in companies today, with an incomplete patchwork of capabilities and policies
- Comprehensive BYOD which is directed at a more holistic and strategic approach to BYOD, and features eight core capabilities companies need to harness BYOD effectively.

In this study Cisco was able to examine the benefits at each stage: from no BYOD at all, to Basic BYOD, and then to Comprehensive BYOD. The results from this case can be applied in the financial sector in South Africa, as the current approach to BYOD is very basic and no value of benefits can be realized.

The study (Cisco IBSG, 2013) revealed additional information on how BYOD impacts on productivity: it emerged that BYOD-ers accomplish more by using their own devices, which yielded the reason that individuals who engage in BYOD through their own laptops and smart devices contribute to the high levels of productivity in the organization.

The purpose of BYOD is to allow employees to utilize a personal computing device for conducting business processes and accessing company data. The impact of the usage of BYOD has not been analyzed to a point where organizations can see true value for the implementation, especially in the financial sector. Although the BYOD revolution has gained momentum, especially in developed countries like the US, where use of mobile devices has grown to 44% of Americans own a smartphone which is used in the workplace, 78% of firms in the US found that there are more than twice as many personal devices connecting to corporate networks compared to two years ago (Cisco IBSG, 2013).

2.6 BYOD risk distribution impact

The financial sector has always been affected by growth of technology. All types of technological advancements have influenced operations, and this was a contributor of the banking crisis in 2008 which brought with it the challenge of reduced revenues. To recover from these challenges faced in that period, organizations are seeking ways to differentiate its business from competitors.

One of the ways to do this is by harnessing the latest mobile technology. Although enterprise mobility seems appealing for a variety of reasons, including reduced cost, flexibility, workforce management and competitive edge, it must be handled in line with regulation.

New international regulations such as the Dodd-Frank Act in the US, the UK data protection act, and protection of personal information (POPI) acts in SA, have presented new and complex compliance challenges for enterprises managing mobility (Liesching, 2014). Although it seems that the financial sector has been hesitant to use BYOD in their environments, this is an opportunity for banks to use technology initiatives which can positively impact the lines of business, the customer and employees experience to achieve the overall bottom line.

Needham Bank (Kitten, 2014) has discovered that the use of BYOD is about managing the content and not the device; financial institutions must weigh possible gains in productivity against the security risks. The main reason is that a number of banks fear the use of BYOD due the highlighted security factors. A survey (Crosman, 2013) highlighted this issue that mobile devices are viewed as the riskiest vehicles for all data in the bank. Further institutions who have adopted BYOD include the National banks of central Texas which has rolled out a mix of iPhones, iPads and Android devices to its 10 branch offices. In the UK banking giant Barclays has adopted BYOD by purchasing 8,500 iPads to facilitate face-to-face customer interaction. Today, financial services organizations represent the highest mobile device adoption of any industry sector, accounting for 24% of all enterprise mobile device deployments and 30% of iPad activations (Gupta, 2013).

ENISA which an agency of the European Union, established to contribute to a high level of network and information security within the EU, performed extensive research on information security risks, opportunities and vulnerabilities related to the use of smartphones in banks (Chin, 2012).

The report evaluated the risks associated with adopting smartphones, and the top five security risks which were identified include:

- Data leakage: a stolen or lost phone with unprotected memory allows an attacker to access the data on it
- Unintentional data disclosure: most apps have privacy settings but many users are unaware (or do not recall) that the data is being transmitted
- Phishing: an attacker collects user credentials (e.g. passwords, credit card numbers) using fake apps or (SMS, email) messages that seem genuine
- Spyware: the smartphone has spyware installed allowing an attacker to access or infer personal data.

These are known risks across the globe which organizations are addressing via different strategies. Global information technology leaders recognize risks related to BYOD; however, the pros related to this concept are too attractive to ignore nowadays.

2.7 Device management

The big challenge is the management of both bank-owned and employee-owned mobile devices with the data and application security controls required to address the robust governance, compliance and asset protection needs of the banking environment. Institutions around the world all have certain processes in place to help achieve these objectives, but the common solution is the utilization of mobile device management (MDM) services to enforce them. According to the Human development Index (HDI) industry leaders continue to be preoccupied with managing mobile device support, though there appears to have been a shift from reactive, frantic support to proactive, innovative support.

Figure 1, shows that 53% of enterprises say they are “keeping up with” or “staying ahead of” mobile device technology, up from 43% two years ago, and just 40% now say they are “struggling” to keep up, down from 52% in 2011 (Rains, 2014).

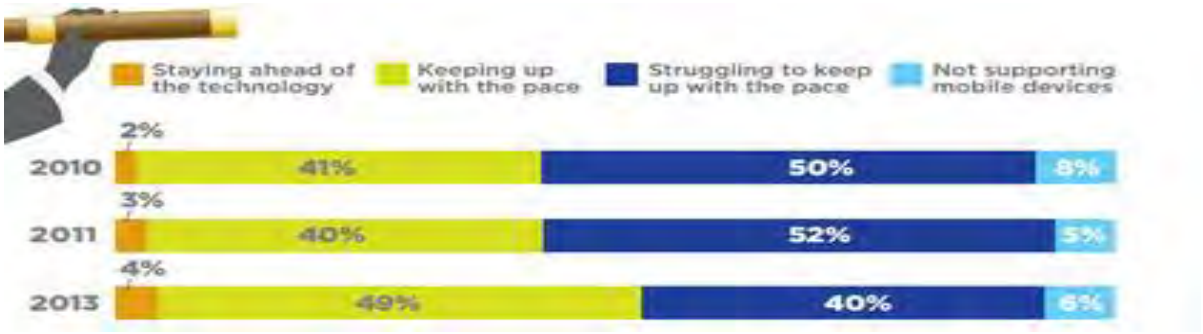

Figure 1: Device Management Trends

Literature by other industry experts it is noted that achieving objectives of a common solution leads to utilization that can be managed though comprehensive BYOD implementation, where the institution needs to weigh the productivity gains versus the risks expected. In another report it viewed BYOD in financial institutions as a possible way to reduce costs, and increasing employee productivity. However, BYOD in financial services companies is more than just moving ownership of the device to the employee (Rege, 2012) . It has complex and hidden implications for which a strategy needs to be defined before implementation.

CISCO recently completed a study showing that by implementing Comprehensive BYOD, companies can improve the productivity benefits. This was proved by research completed in these developed markets (the United States, United Kingdom, and Germany), that the greatest productivity gains when moving to BYOD users are enabled to be more innovate in how they work. This is largely due to the new ways of working BYOD introduces: work practices can be enhanced to become more effective for the worker. In contrast, in the same study it was discovered that in the emerging markets (India, China, and Brazil); the biggest gains come from reducing mobile users' drags on productivity, such as distractions and downtime, and increasing their availability and ability to work outside standard office hours and locations. Current literature has identified the big concerns about BYOD usage in this sector: in the past employees were given tools to conduct their work. These tools were locked down and under very tight security. The introduction of BYOD removes the lock-down mechanism and this removes the power for organizations to integrate, regulate and secure a wide variety of devices that they do not own, nor hope to fully control.

The American Bank (Crosman, 2013) reported that BYOD blurs the lines of distinction between work and personal lives, with employees adding their own apps to devices they use for work, not all of which may

be trustworthy. The big question in the financial sector is: How do employees and IT departments capture the benefits of BYOD while managing the security risks, many of which they may not have seen before? This question has been addressed by different organisations, not only in the financial sector but across all industries. Banks, like many businesses, are finding themselves modifying their approaches to BYOD as the benefits begin to appear to outweigh the risks. Although IT leaders and other executives still have security concerns, they have become more likely over the past couple of years to accept employee-owned devices because of their potential to improve efficiency and innovation.

A new taxonomy for dealing with BYOD security challenges has been divided into two dimensions which were used (Downer, 2016) as a framework to implement comprehensive BYOD solutions.

This framework could also be used alongside MDM to help facilitation in the organization. It was found that BYOD is broken down into:

Dimension 1: the security challenges are classified according to areas and resources of the organisation they affect most which is most likely based on their work practices.

Dimension 2: the identified concerns are separated into similarities and logical relationships which points to the equipment 'deployment challenges' and 'technical challenges.

The use of these two dimensions to start building a framework proved to be successful in this literature; however, limitations were identified which include dealing with the multi-layered nature of BYOD, its impact on practices in the organization and devising BYOD security policies to be enforced.

It is clear that BYOD can bring about great benefits to the financial institutions, but it can also bring about major risks that can be detrimental to the bank. A factor that has not yet received much attention in literature is the relationship between BYOD and the ability to increase work practices.

Chapter Three: Theoretical Frameworks

Theories provide complex and comprehensive conceptual understandings of things that cannot be pinned down such as how societies work, how organizations operate and why people interact in certain ways (Reeves, 2008). Therefore, the theory proposed for this study will provide a view through different "lenses" through which to look at the identified problem which will bring the focus to the different aspects of the data and provide a framework within which to conduct analysis.

3.1 The Theory of planned behaviour (TPB) and Technology acceptance model (TAM) evolution

The Theory of Planned Behaviour (TPB) and Technology Acceptance Model (TAM) are widely used models in a number of areas to better understand end users' intention to use new technology and systems (Armitage & Conner, 2001). Although TPB and TAM have been widely applied to examine adoption and acceptance of IT, has been found to provide consistently superior explanations or predictions of behaviour (Chen, 2007). Therefore, a number of researchers worked on the possibility to integrate TPB and TAM 1, 2, 3 to examine technology adoption owing to the complementary. Explanatory power of these multiple models created the Unified Theory of Acceptance and Use of Technology (UTAUT) model (Chen, 2007).

The key focus of this study is the usage of BYOD and its impact on work practices in the financial sector. The use of UTAUT in studies is because the constructs provide robust empirical support in order to address the technological and social factors influencing the implementation of BYOD in the financial sector.

The UTAUT model was created due the limitation of technology adoption models. While this study is about impact of BYOD, there is value in the analysis of this theory to identify elements which could be used for the proposed model. The researchers created a model to study common adoption decisions and innovation behaviours on people across organizations. The base of this theory was derived from the consolidation of constructs of eight models in Table 1 that earlier research had employed to explain information systems usage behavior.

Table 1: Combined theories for UTAT

Combined theories for UTAUT
The theory of reasoned action
The technology acceptance model
The motivational model
The theory of planned behaviour
A model combining the technology acceptance model and the theory of planned behaviour
The model of PC utilization
The innovation diffusion theory
The social cognitive theory

UTAUT is based on the identification of certain factors considered to be significant in affecting a person's decision on whether or not to adopt a particular new technology (Venkatesh et al., 2003). The theory holds that four key constructs (performance expectancy, effort expectancy, social influence, and facilitating conditions) are direct determinants of usage intention and behaviour of PC utilization, innovation diffusion theory, and social cognitive theory. This theory is well suited for the research as a study was conducted (Sundaravej, 2005) to test the validity of the reach which confirmed that the reliability and validity of each construct from every model shown above, these seven constructs tested an validated will possible the main constructs in the proposed model. The model has indicated that perceived usefulness affects a person's attitude toward using the system. This was further explored by Lai and Yang (2009), who argued that employees in a performance-oriented e-business context are generally reinforced for good performance and benefits, leading to the possibility that the use of new technology strategies such as BYOD is focused on the use of personally owned devices, already seen as easy to use to perform work tasks. One of the elements of this model includes perceived usefulness and perceived ease of use. Relating to the BYOD phenomenon, a user will have ease of use of BYOD as they will be familiar with the devices being used to conduct work leading to good performance.

3.2 The price of convenience

The discussion related to effective usage of BYOD in the workplace can be guided by the Ng-Kruelle and Swatman (2005) framework. The price of convenience is illustrated in Figure 2, where price is not employed in a common economic sense, such as the monetary value of a service (Ostler, 1941). The term "price" is referred to as a metaphor, such as "price of freedom".

The framework argues that a conceptual analysis of individuals balances the convenience of being mobile against the associated loss of privacy and the potential implications of that loss, as illustrated in Figure 2.

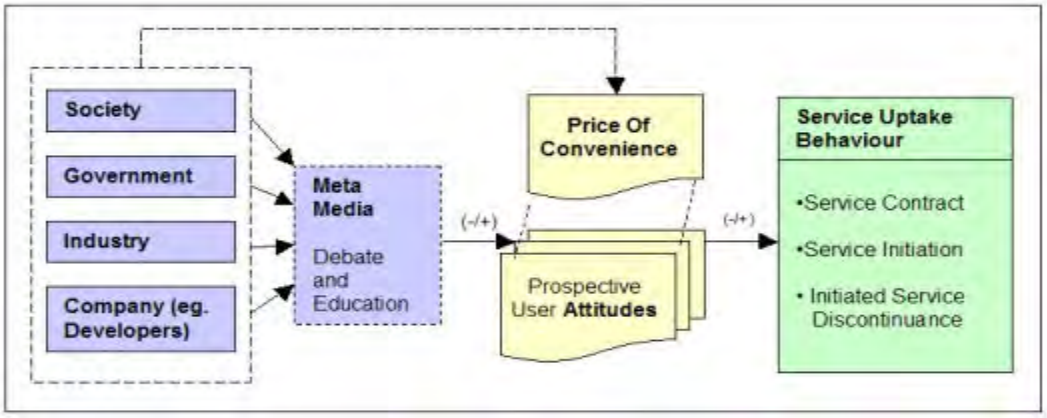

Figure 2: The Price of Convenience

BYOD will affect privacy, workload and work practices as seen in the literature thus far, which will result in an overall impact in the organisation and the employee – but to what extent?

Author (Brin, 1999) applied the framework in order to constitute elements such as Accountability, Openness, Freedom, Privacy, Anonymity and Secrecy which led to the formation of the constructs.

1. Freedom: Freedom is frequently, even reflexively likened to privacy, which is required when implementing such technology strategies the freedom of employee to use their personal devices as they wish and the freedom for the organisation to install rules of conduct for the devices as they have company information.
2. The concept of anonymity, which refers to being unknown or unnamed in the framework. This element is not applicable to this paper as it is an important factor for any organisation that employees should be transparent.

3. Openness refers to the widely perceived “borderlessness” of modern society experienced by the more affluent members of most societies in the framework. This element is closely related to privacy and can be combined for the purposes of this research.

This framework resonates with the BYOD phenomenon, and this could be adapted to address the impact on work practices as the model addresses all areas which are linked to the privacy and workload issue. Second, they can provide a link between traditional work practices and the evolution of work practices due to BYOD through analysis of the behaviour component of the framework. The only area not mentioned in the framework is the security aspects of convenience which will require the framework to be further developed.

3.3 Cognitive Model

The cognitive model by (Lazarus, 1984) defines stress as the result of an interaction between an individual and the environment, including stressful situations or conditions, which they refer to as “stressors”. This model was used reviewed (Niehaves & Ortbach, 2012) to identify the stressors in an organizational context. These stressors emerge when individuals cannot cope with new technologies or a high workload. This relationship refers to the use of BYOD and the amount of stress imposed on the employees to balance their work/personal life. In the study it was found the influence of stressors causing an increase in workload and greater autonomy are familiar effects of the IT consumerization trend. As a result, the individual’s well-being and hence the organizational productivity are influenced negatively (McGrath, 1976).

3.4 Theory for Consumerisation of IT

A number of authors have been working towards an Information system s theory for consumerization of IT (Niehaves & Ortbach, 2012). In Figure 3 this resulted in a combination of Cognitive Model of stress and Self-determining theory.

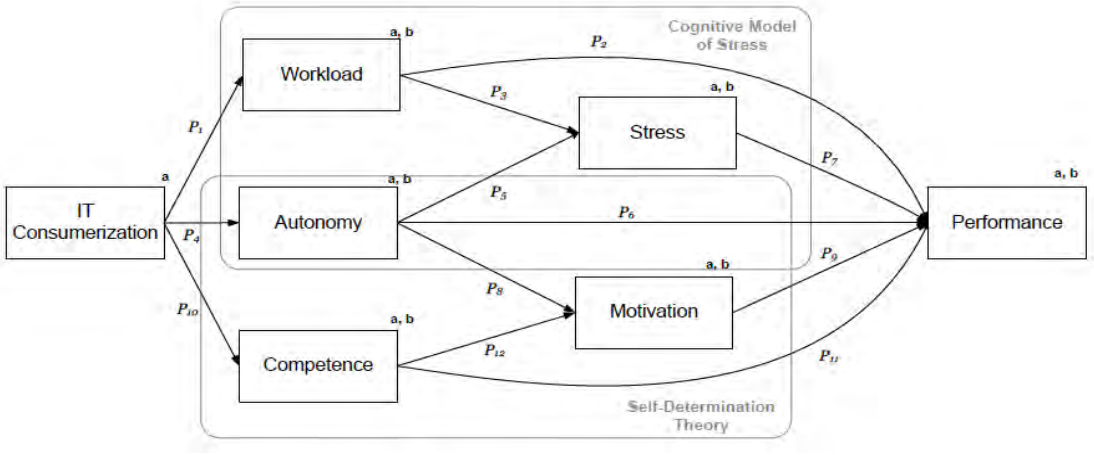

Figure 3: Theory of Consumerisation of IT

The model was built to contribute to IT consumerization theory from the practice-oriented view, in order to determine the effects of IT consumerization on individuals, namely increased workloads, perceived autonomy, and perceived competence.

The developed model is in line with the BYOD phenomenon, and can used in other studies to further refine the theory as this model focuses only on the effect on the individual and does not address the impact on the organizations. In addition, the model will require further testing and development as it has only been developed on the basis of IS practice literature as well as IS theory.

3.5 Proposed BYOD implementation framework

This study aims to present a conceptual model of how the implementation of BYOD can be completed in such a way that it impacts on work practices and other factors can easily be identified, based on the elements from the models reviewed in the literature, UTAUT, POC and CoIT theory.

3.6 UTAT-derived elements

Numerous studies have established the influence of stressors on employee stress perception. This is seen in the literature review that revealed an increase in workload and employees demanding greater independence contributing to the BYOD trend. Modern work environments and practices are characterized by both work overload and independence, providing workers with more freedom, but

concurrently with greater responsibilities compared to traditional work practices (Ahuja & Thatcher, 2005).

The influence of BYOD makes it possible for workloads to increase, and affects work performance positively or negatively, especially in the long run. Therefore, it is likely that BYOD contributes work practices by affecting workload and work performance. Through corporate influence on private IT, the workplace is extended into the private sphere and there are higher expectations concerning connectivity and willingness to work, which extend into what would normally be off-hours (Dell & Intel 2011a). Based on the above considerations, we propose the following constructs:

- C1: Behaviour Intension
- C2: Performance
- C3: Workload

3.6 POC-derived elements

Independence is defined as "the degree to which the job provides substantial freedom, independence, and discretion to the individual in scheduling the work and in determining the procedures to be used in carrying it out" (Hackman & Oldham, 1976). Work independence is very dependent on the type of work practices applied in the workplace. In addition, the POC model considers the impact on the Industry, company and government when balancing the convenience of being mobile with the associated loss of privacy and compliance issues. As BYOD is considered to provide employees with greater independence and freedom, for instance by allowing them to choose their own IT equipment (e.g. Murdoch et al. 2010), we can propose the following constructs:

- C4: Industry

3.7 CoIT-derived elements

In the literature, a theme was recognised that if a user selects their own device for work purposes it will increase their independence and motivate them to performance because users who select their own devices are familiar with the device and will be more motivated leading to increased productivity (Cisco, 2011; Dell and Intel ,2011b). This direct relationship is also supported by recent IS research. For

instance, Elie-Dit-Cosaque et al., (2011) stated that “independence enables individuals to cope effectively with changing work conditions, including those from IT “, therefore we can propose:

- C5: Motivation
- C6: Work practice type.

The elements from each of the reviewed models will reflect the importance of the identified themes within the proposed BYOD implementation framework in Figure 4 in the financial sector in order to assess the impact on work practices.

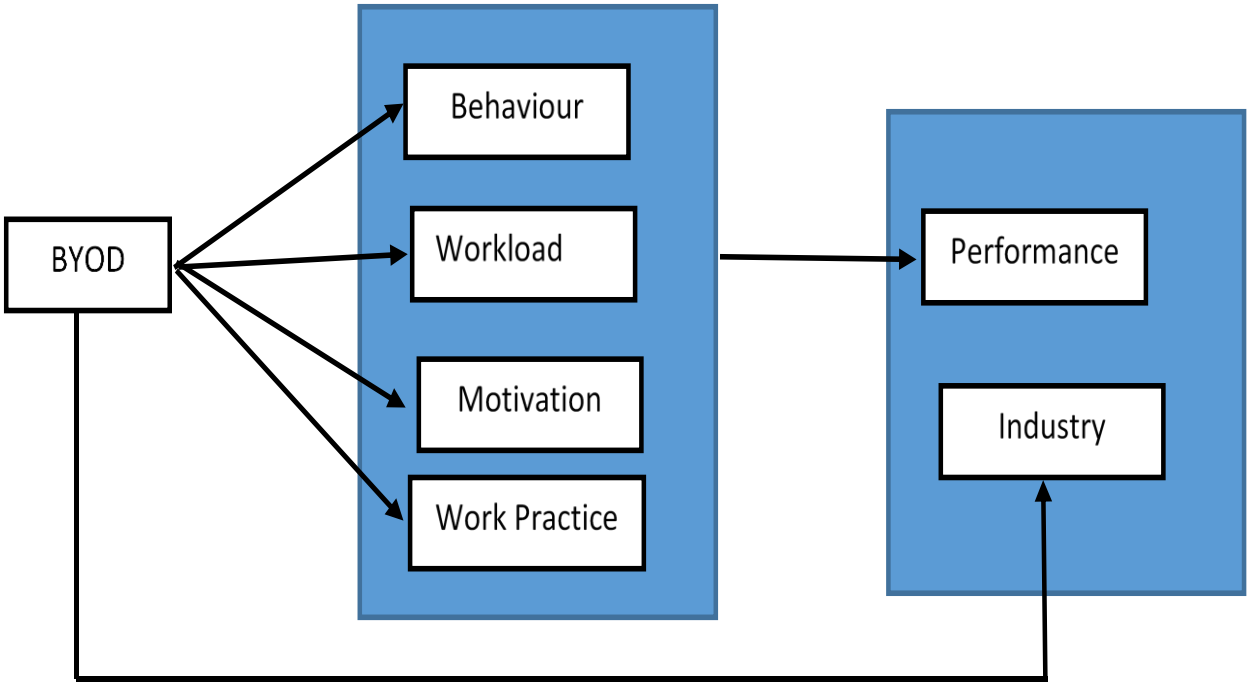

Figure 4: Proposed BYOD Implementation Framework

The conceptual framework proposed hopes to examine the factors that impact work practices in the workplace. It shows four main relationships identified though the literature of BYOD in the financial sector. These relationships impose an overall impact on the industry standards and regulations. Therefore, this research will explore these relationships to help identify the framework’s true standing when tested in the workplace.

Chapter Four: Methodology

To address the research questions, an exploratory study was applied within three organizations, all in the financial sector. These organizations were selected because they were known to be very traditional but also have an interest in diversifying their technology portfolio. To obtain data for the qualitative evaluation on the subject, 15 semi-structured interviews were conducted with senior management and a short survey was distributed to lower-level employees from 27 October 2015 – 15 January 2016. The remainder of this section relates to the descriptive aspects of the research and is broken down under the following sub-headings:

- Research philosophy
- Approach and purpose
- Research instrument
- Target population and sample
- Sampling and related Risks
- Data-collecting method
- Data and analysis
- Expected or possible results
- Reliability and validity
- Assumptions, limitations and difficulties

4.1 Research philosophy

This research followed the interpretivism research paradigm. This is dependent on constructivist ontology. The philosophy is explained by Beath (1991) in the following way: Ontologically, interpretive information systems research assumes that the social world that is, social relationships, organizations, division of labours are not "given". Rather the world is produced and reinforced by humans through action and interaction.

This study aimed to focus on one research paradigm mainly, being interpretivism; this paradigm makes it possible to analyze human behaviour. Interpretivists argue that if we want to understand social action, we have to delve into the reasons and meanings which that action has for people. As this study involved social actors who have the ability to think and reflect, scientific methods are inappropriate for the study of society (Badewi, 2013).

An inductive approach by means of the thematic analysis of data was used to analyze the BYOD phenomena in the workplace though this study analysis examined the predominant themes within the sampled data which revealed the impact of BYOD in the workplace.

4.2 Approach and purpose

The movement of BYOD originated in the United States (US), as mentioned in the literature review. For this reason the topic has not reached a wide audience in South Africa. This study will produce a conceptual model based on established theories. This approach is known as the inductive approach and its purpose is to establish clear links between the research objective and the summary findings derived from the raw data, to develop a model or theory about the underlying structure of experiences or processes that affect work practices. The explanatory research approach will be used as it is the best suited approach for establishing fundamental relationships between different variables (Saunders, 2002).

The research is conducted through qualitative data collection methods such as interviews, focus groups observations and questionnaires. These methods will assist to add knowledge to the phenomenon of BYOD. In addition, descriptive statistics will give insight by answering the research questions and through analysis of the data that is collected the results will reveal the impacts of BYOD.

For the prior data that was collected in the 2011 research, the study was based on surveys conducted online. This happened at a financial institute over the period of their financial year end. This period limited the number of respondents, to mitigate similar challenges the data collection for this study was before the financial year end to allow respondents time to participate. The cross-sectional timeframe is considered to be appropriate due to the constantly changing nature of industry trends and strategies.

4.3 Research methods

This study is mainly qualitative because these studies are inquiry processes of understanding based on distinct methodological traditions of inquiry that explore a social or human problem (Creswell, 1994). This revealed areas that are not fully understood by the organization. Information will be collected through surveys and interviews. The aim was to “get inside” the way each group of people sees the world.

4.4 Research Instrument

The research instrument is based on interviews and surveys which was used to support identified themes from the literature in Table 2.

Table 2: Research Themes

Themes	Names
T1	Behaviour Intention
T2	Performance
T3	Workload
T4	Industry
T5	Motivation
T6	Work practice type

Table 3 displays the logical mapping between the constructs of the research models, the questions in the research questionnaire and the proposed constructs.

Table 3: Logical mapping between the constructs of the research models

Identified Constructs	Questions Asked	Related Themes
Section A		
Demographics of User		
C1 Behaviour Intension	Q1	T5, T4
Section B		
Performance and Motivation		
Performance	Q1, Q2, Q3	T2
Motivation/ Work practice type	Q4, Q5, Q6	T2, T1, T6
Workload	Q7, Q8	T3
Challenges	Q9, Q10	T3, T4,T5,T6

Note: The final version of the proposed questionnaire is illustrated in Appendix A.

The use of a questionnaire was therefore applied, the first part of the research was based on questions which included; section A helped collect the demographics of the individual in the work place, section B formed the core part of the questionnaire and was designed to test the constructs of the research model depicted in Figure 3.

This was followed by interviews with management: section A, which aims to test proposed constructs of BYOD behaviour and type of work practices affected by this trend in the industry; section B forms the testing of constructs based on performance and workload associated the use of BYOD in the workplace breakdown in Table 4. These sections in the interviews attempted to provide more information in order to answer the primary research questions, while sections A and B in the questionnaire addressed the secondary questions based on the actual application of work practices through BYOD.

Table 4: Interview Planning

Interviews		
Section A		
Behaviour Intension and work practice		
Performance	Q1, Q2	T2,T5, T6
Industry	Q3, Q4, Q5	T4
Section B		
Industry and workload		
Work practice type	Q1, Q2, Q3,Q4	T1, T5, T6
Performance/Industry	Q5	T2

4.5 Target population and sample

The sample group was from a financial institution in South Africa. This included all levels of employees to cover a wide span of results. The interviews will be with only the senior managers, as interviews require a considerable amount of time to conclude and the senior management provided more insight into common work practices that are standardized in the workplace. The surveys were distributed to a wider sample which included employees at the head office broken down into subgroups.

The participants were invited to engage in an interview via an interview consent form which had the list of proposed questions. The voluntary nature of such an interview was explained and emphasize that the participant can withdraw at any time during the session. The use of a mixture of open-ended and closed-ended question was proposed to the participants; this was based on specific roles of the participants in the organisation.

4.6 Sampling and related risks

The use of a probability sampling technique named stratified sampling was applied because it allowed the researcher to divide the entire target population into different subgroups, or strata and thereafter, randomly select the final subjects from the strata. The reason for selecting this method is to highlight specific subgroups within the population because BYOD affects groups differently.

The intention of this study was to use financial services companies in South Africa to conduct the research. These organizations have a form of BYOD underway but it is not effectively managed. Therefore, the organizations were deemed suitable for the study; permission to conduct this research at the organization was obtained in writing from the CIO/ head available.

For the purposes of this research, the study didn't focus on the entire organisation but sub-groups/departments within the organization, which was divided into strata. These were recognised as the actors who are involved in BYOD decision-making and technology strategies.

4.7 Data collection method

Using qualitative methods data was applied through interviews and surveys, the interviews and surveys were semi-structured; then an online tool was used to collect data and analyze findings. Once the data was collected it was uploaded into Qualtrics for analysis and evaluation in order to gain further insight into the impact of BYOD. This process prompted additional questions to be asked based on the interviewee's responses to the questions, as well as giving the interviewees the opportunity to expand further on their responses. The semi-structured interviews included a list of themes recognized in literature and questions (refer to Appendix C). The interview questions differ in terms of order and type

of questions asked because some questions are not applicable to certain roles the interviewee fulfils within the organisation.

After the interviews were conducted and transcribed, they were made anonymous and edited, and thematic analysis was used in order to identify common themes. During the analysis relevant quotations were taken from the interviews and examined separately for similarities and differences. This led to the list of five themes which are: Work practices, loss of control, pace of change, device usage, evolution of technology, and behaviour workload.

4.8 Data and analysis

The data was retrieved in Qualtrics and if data was missing, the information from the questions was rejected. From these results, descriptive statistics, along with simple graphs, provided an overall view of the data collected. A situation might rise that the data collected will not fit normal distribution, and so non-parametric statistics would need to be employed to ensure accuracy in the results due to the questions in the survey being ordinal.

After each interview was completed, the data was transcribed from the recording and used to identify initial sets of patterns and trends, therefore, after application of abductive logic. This method was formulated by Peirce (1940) who said the process of discovery intends to provide an explanation of a new or surprising fact, being subject to logical categories and criteria such as the process of proof. Therefore the data was analyzed to examine events from the recordings; thematic analysis and coding was used to uncover themes and patterns in the data. Furthermore, the final step involved the use of the identified theories in this research to assist in explaining, predicting, and understanding the BYOD phenomena. These theories were linked to a conceptual framework which was derived from the theory. It was noted that it is important to use the theories because they guide the development of the phenomenon and the design and conduct of the study, attempting to explain how the phenomenon works and which factors facilitate or inhibit the effectiveness (Groves, 2001).

4.9 Reliability and validity

When conducting research the researcher needed to ensure that the study is reliable and valid. This was confirmed by Guba and Lincoln (1981), who stated that while all research must have “truth value”, “applicability”, “consistency”, and “neutrality” in order to be considered worthwhile, each type of research method has specific principles to ensure trustworthiness. In addition, it was stated that for the

qualitative paradigm to ensure trustworthiness, the researcher must ensure that the study has credibility, fittingness, auditability, and conformability. This study was based on qualitative research which is iterative rather than linear. In order to ensure verification the researcher moved back and forth between design and implementation to ensure congruence among question formulation, literature, recruitment, data collection strategies, and analysis (Barrett, Olson & Spiers, 2002).

The use of different strategies, such as peer debriefing, was used to ensure rigor in the study. These tools are intertwined into the study to construct a solid product classifying and correcting errors before they are built in to the developing model. The advantage of such a process helped the researcher to identify when to continue, stop or modify the research process in order to achieve reliability and validity and ensure rigor.

4.10 Assumptions, limitations and ethics

The limitations that need to be considered are as follows:

- The sample group were from a financial institution in South Africa. This included all levels of employees to cover a wide span of results. In some cases the employees did not have access to the internet or mobile devices such as laptops. However, an argument arises that due to the increase in the mobility in the environment a gap may be recognised to equip these employees with mobile devices to complete the daily tasks.

- It was difficult to identify all current work practices in the bank; therefore, only a specific group of work practices could be involved.

- The strict rules and regulations of the bank affected the type of interviews and questions used; however, this did not affect the results as the focus was not on the information stored by the bank, rather the use of devices.

- Individual interviews of participants are a time-consuming process.

The survey questionnaire was accompanied by a cover letter (Appendix B) highlighting the purpose of the research as well as stating the fact that the research was being conducted for academic purposes. The researcher fully intends to honour the privacy and confidentiality of the respondents and ensure that the necessary ethical considerations are adhered to.

This section addressed the research approach of the study; the organisations involved were all from the financial sector. Therefore it was important to ensure that the methodology meets the requirements of this sector.

Chapter Five: Findings

5.1 Population

This research was conducted in three financial institutions within the Gauteng region only; this covered all offices in the province. A combination of employees working in a branch and in the offices was used as respondents. The respondents included a mix of males and females across the region. However, in the interviews the majority of participants were male because individuals interviewed consisted only of senior management. In this industry it is a norm to find most male representative in senior roles.

5.2 Case description

The organisations used in the study form part of the "Big Four" in South Africa, each supplying services across the country and employing over 30 000 people. All the organisations which were included in the study have a deep history that dates back to the early nineteen hundreds. They are all big players in this sector with branches in most of the country and major towns. Due to the increase in technology trends over the years this sector has to be innovative in order to stay relevant for customers, therefore interest in technology trends such as BYOD is essential for investment.

5.3 Findings Details

An exploratory study was conducted in three financial organizations. To acquire data for the qualitative evaluation on the subject, 15 semi-structured interviews were conducted over a timespan of six months, as seen in Table 5. The position of the interviewees within the organizations focused only on senior management as part of the interviews, while a survey was distributed to the wider organization in order to gain insights from different perspectives; 100 surveys were distributed with a 13% dropout rate therefore 87 surveys were completed and 5 discarded due to incompleteness.

Table 5: Overview of interviews

Organizations	# of interviews	Department
Financial Org 1	5	Digital and Payments
Financial Org 2	6	Information Technology
Financial Org 3	4	Shared Services

The main themes identified from the interviews were further analysed in relation to the impact of BYOD on work practices. The following section outlines the main themes and subthemes emerging from the analysis of the interview transcripts using thematic synthesis. Using the themes found during the synthesis process the following section gives insights into the impact of BYOD on work practices by addressing the risk and opportunities that arise from its implementation.

5.3.1 Work practices

Only five participants fully understood the term "work practice in the workplace"; this term had to be explained to a number of participants in the interviews to ensure accurate responses. Once the definition was fully explained one participant described:

"The way I work with my team has drastically changed over the years and technology is the biggest factor."

She went on to explain how BYOD would actually change the face of the bank in terms of the traditional working model. At the moment the sector is still very traditional, with a few exceptions for certain areas.

One respondent indicated that *"as a senior member of the organisation I have certain incentives which allow me to access additional devices such as a tablet which I can use at the office and at home; it has changed my daily working routine but it a good change – I think I work smarter now."*

This finding showed that the financial sector is aware of the BYOD strategy but chooses to implement it only at certain levels. To quote another respondent: "*My manner of working has changed – I look at the way I work and some of the methods and procedures I apply have changed due to using my own device".*

It is evident that BYOD has had an impact on this industry, but the implementation approach is restricted only to management and executives, rather than organisation-wide. When asked about the introduction of BYOD at this level only one participant shared that: "*It's new and not widespread but it's made my life simple and I am more productive; it's good to see that the financial sector is willing to listen to us. We are normally very risk-adverse and don't adopt trends as quickly as other industries".*

This comment supports the findings from the survey that 47% of respondents indicated that financial sectors should enable BYOD because it would increase productivity and allow for more flexibility, as shown in Table 6.

Table 6: Drive for enabling BYOD in the organisation

#	Answer		Response	%
1	Yes		43	47%
2	No		14	15%
3	Why:		34	37%
	Total		91	100%

Employers should aim to facilitate a work environment where employees feel valued and where the technology needs are met. This will lead to increased enthusiasm and highly engaged employees, as we have seen with the selected management team who use BYOD. One of the ways to accomplish this is to offer employees flexibility in when and where to work, combined with superior communication technologies such as the use of smart devices (Brummelhuis, 2012).

The change of work practices already occurs naturally in organisations, due to technological, structural and economical changes in the environment. The impact of this shift has resulted in a more dynamic working environment for all industries.

An example based on the findings is the way the management team moved from reliance on organisational issued tools to the use of their own tools to deliver work. The shift from the management teams was not introduced by training, but it was instinct that drove the adoption once the devices where introduced into their environment; their behaviour and work practices began to evolve.

This can be seen as an advantage for the organisations where on-boarding costs can be reduced because the individuals are already capable. The use of new media technology (smartphone, email) is suggested to facilitate efficient use of time and increase ways to easily coordinate work tasks, hence providing flexibility in the manner an individual works (Hurme, 2005).

In comparison to working without BYOD enabled activities people multitasked less and had lengthier tasks to focus on (Mark, 2012). When combing these two studies Brummelhuis, 2012 and (Hurme, 2005)one could interpret that those employees who are empowered through the BYOD strategy can communicate more effectively and efficiently by using their own electronic devices combined with organization-issued devices (Hommel , 2013), therefore leading to an environment where employees are motivated and more productive.

One participant explained that *"My direct team which I manage often asks when they will get an opportunity to use their devices for work purposes; my view personally is I wouldn't mind them using their devices and applications to deliver but it's not my call to make unfortunately*".

This comment brings to light that while certain pockets of the organization can see some benefits of BYOD on their daily work practices, the is still a need for a change in the manner the lower levels in the organisation work.

5.3.2 Impact on work practices

During the interviews a number of work practices which have changed the way the management team works were described:

"As a member of the team I have seen how my old way of working was time-consuming compared to working with my personal tablet; I can use my own applications for business reports, I have access to more market tools and [am] not reliant on my laptop."

Furthermore, one participant mentioned: *"I enjoy using Skype rather than gathering all in one place because it is not always possible to have all the teams in one meeting when working on a global project; these virtual meetings allow us as a project team to always be connected".*

It is evident that there is also an increase in the collaboration among employees, as seen in literature, that by using own devices when collaborating on projects employees tend to be more effective (Seigneur & Kölndorfer, 2013).

Table 7 further indicates that most users across the organization would rather use their own business applications for their daily activities if BYOD were organization-wide. One participant stated:

"*Using other applications than the company-installed application on my PC, will allow me to be more creative or actually help manage my workload better."*

These comments from the participants bring evidence that the impact of BYOD on work practices is positive and can contribute to resourcefulness, but only for the selected group because BYOD is conformed to selected members of the organisation.

Table 7: Use of smart devices in the organisation

#	Answer		Response	%
1	Emails		28	30%
2	Business Applications		30	33%
3	Mobile Applications		7	8%
4	Personal use		16	17%
5	Other- Others Specify		11	12%
	Total		92	100%

In contrast, the effect on the wider organisation has to be assessed, while the management team see the benefits and are more productive through the use of BYOD. The other employees are excluded from this due to organizational hierarchy.

When this subject was addressed, feelings of unfairness were prevalent across some of the interviews. Participants saw those in positions of power with the decision-making authority to extend BYOD to the wider organization as not actively pursuing it because:

" … .and when you go to motivate for your team, you're told that it's not a focus for the wider organization yet, which is a problem because it's like a barrier between management and the lower level employees".

The use of BYOD only affects the work practices of those who have been given the mandate to use their personal devices; for other employees in the workplace the use of traditional practices is still applied.

These work practices are applied specifically only to this group of management, which confirms pervious literature that high involvement work practices (HIWP) are non-traditional HR practices as displayed by the selected group who have access to BYOD. This is visible for the group of management and executives who are seeing the benefits, experiencing higher levels of productivity and more autonomy (Ichniowski, 1996).

In addition, these work practices are grouped into three dimensions: the specific groups include selection of employees for BYOD due to high relative skills requirements, i.e. "Executive"; the manner in which the job is designed for the individual which requires specific tools and access to additional devices; and the influence of incentives for executives compared to other teams in the organization.

As part of this study the main objective is to examine the impact of these practices on BYOD usage in the work place. Consequently, the findings have indicated that BYOD in the organization is a strategy only for employees who fall within a certain work practice dimension. Other employees who fall out of the three dimensions will not have access to engage with BYOD, therefore negatively impacting their way of working due the barrier of restricted tools for work.

All these dimensions have to be considered when evaluating the use of BYOD in this sector or it may lead to new silos due to technology usage. One participant was in support of the restrictive implementation approach because: "as *usage evolves to a norm and costing models are understood, debates about choosing your own device and bringing own devices are clear; then we can start to roll out to the wider organization; it's going to take time and change the current traditional practices but it's on the cards".* It's ultimately the decision of the organization to decide the approach for implementation – "big bang" or restrictive in a form of a proof of concept.

5.3.3 Loss of control

Given the desire of workers to bring the devices they use at home into the workplace, enterprises need to adopt a BYOD vision – that is, securing the network and data regardless of how workers access information. Today's IT departments need to enable the chaos that comes from a BYOD environment (Thomson , 2012).

Table 8 indicates that the surveyed users without an approved mandate from management to engage in BYOD still manage to connect to the organization networks. As seen in Table 8, 63% of employees believe that BYOD is allowed in the organization. While management has only given the mandate for senior management and executives, the perception is that if the device can easily connect to the network, the organization does allow BYOD. In other organizations it was found that access is given for use of the corporate Wi-Fi on devices, which is confused with implementation of BYOD.

Table 8: Does the organisation allow BYOD?

#	Answer		Response	%
1	Yes		56	63%
2	No		33	37%
	Total		89	100%

In the interviews the same trend was recognized when a participant warned about the need for caution when implementing the BYOD strategy because:

"It would be so easy for me to use my phone instead of carrying my laptop, especially when I am between buildings. However, I know my staff will take advantage of this and possibly never come to the office because they can work from anywhere. I am still a bit old-school and would prefer to see my team often; I hope BYOD won't take this away because I don't think my team is that mature yet".

One participant believed that it might be misused, leading to more problems in the organization as described:

"It's already difficult to manage some teams with the current technology, so if we allow smart devices, how will I know where my team is and what guarantee do I have that the data I share with them is safe?"

Another participant stated: *"I am excited about the potential of BYOD for all but we need to be careful here, BYOD will change jobs, duties and ways of working, so at some point this needs to be relooked at; we need to do a cross check of traditional duties to new duties introduced by BYOD".*

The general feeling from the interviews was that work practices would need to be re-defined in order for BYOD to be successful, for example the use of Skype rather than a sit-down meeting, WebEx rather than a workshop in the office, the expectation of staff to be on emails at night and on weekends and possibly more micro-managing through cyber-stalking. In the findings it was also clear that some individuals were hesitant about BYOD because of all the new risks it could introduce, describing it as "chaos".

5.3.4 Pace of change

When asked about the possible change of pace in the organization due to BYOD, participants showed cheerfulness as this sector is known for very traditional ways of working and a large amount of red-tape

to make decisions. The possibility of new practices provided a sense of increased trust amongst employees as identified by this participant:

"We definitely need some change from the way we work and BYOD can help. I look at my other acquaintances from other industries – their managers trust them so much more because they're always available on their devices and can follow up on items quickly. Any person would like to work at a company which has the latest technology so lack of in this sector may even cause me to move where I can get exposure to more tools."

5.3.5 Device usage in organization

Many participants felt that they were restricted by the type of devices used in the workplace; most employees can only use the issued laptop for work. A standard laptop would be provided to all employees and only the senior management and executives have access to additional tools.
There was a sense of needing more than a standard laptop, as a participant described:

"I feel that if the bank allowed more people to choose the devices we need to do our tasks we would be more productive and creative in our ways of working".

Many participants mentioned that if the organisation would diversify the device choice it would actually increase employee morale. Furthermore it was mentioned that "*the functions that can be performed on a laptop tend to be restricting compared to a tablet, especially when working in more than one site."*

Lack of mobility and ability to use own applications to check emails and presentations, for example, were seen as hindering their performance and productivity. Another participant found that the lack of mobility and application freedom was demotivating:

"It's a bit demotivating to only use one's device to perform tasks, when there are other applications and devices out there which can save time and provide a better result."

These comments confirm previous findings that most workers believe that the technologies they use in their personal life are "better" than those in their professional life (Disterer & Kleiner, 2013). It was evident from findings that BYOD brings about an opportunity to increase productivity in the workplace with little effort.

In the survey the respondents were asked if they owned a tablet, or laptop/PC, as shown in Table 9: based on their response, they were asked a series of questions to understand what activities they did on these devices.

A typical smart device was identified to participants as devices that have the functionalities of a computer, such as a touchscreen interface, access to the Internet /Wi-Fi, and an operating system capable of running and downloading applications. Tablets were identified as wireless portable computers with touchscreens that allowed users to download and install applications. Laptops were identified as mobile computers that are larger than tablets and typically run PC OSs, like Windows or Mac OSX. Table 9 represents the functionality participants use on a daily basis in their environment.

Table 9: Device ownership in the workplace

Devices	Percentage
Tablet and own laptop	16%
Tablet and company laptop	32%
Company laptop/No tablet	43%
Own laptop/No tablet	9%

Table 10: Device functionality usage in the workplace

Device Use/Functionality	Percentage
Emails	30%
Business application	33%
Mobile application	8%
Personal Use	17%
Other	12%

Table 9 and Table 10 display the percentage of users with devices and the functionality used most. It was found that laptops are owned by almost everyone surveyed, which was expected because of the nature of the financial industry where it is a norm to issue a standard laptop for business usage. An unexpected figure of 17% was found in the surveyed population, which indicated that a small group use their smart devices only for personal use. One potential reason could be the tight security measures applied to corporate networks within the different institutions and the manner in which BYOD is currently implemented in these organizations. In all the organizations surveyed in this study, BYOD has not been implemented organization-wide but rather in pockets as a proof of concept.

It was also noted that restrictions to access the network via personal devices caused frustration, lack of freedom and impacted overall productivity. This was supported by the interviews which were held with 15 senior managers, where the trend was lack of access on devices to certain sites and applications. In

the interviews the overall mood of participants towards BYOD could be summarized by the following quotation: *"Employees find it more empowering to have access to any application from their personal device or work issued; the restrictions applied by IT policies can restrict creativity.*

Professionals around the world are being affected by BYOD because it is rapidly transforming enterprise workspaces and work practices by providing the employee the power to work from anywhere, at any time shifting the 24/7 paradigm, by blurring the lines of personal and work life by allowing both to take place. As the employees are already familiar with the device, it can help to reduce the training time, thereby increasing the productivity and efficiency. BYOD offers largely financial benefits as well as other benefits which are intangible, making it difficult to measure (James & Griffins, 2012).

5.3.6 Evolution of technology

The success of adopting any new technology strategy is determined by the actual users, in this case the employees and their willingness to use their personal devices within the rules set for them (Eschelbeck & Schwartzberg, 2012). Such a strategy is a big leap for the financial sectors, historically adopting technologies has always been based on what is needed for employees at that point in time.

The financial services sector was one of the first industries to embrace ICT, automating their back-office and branch operations and developing innovations like credit cards and ATMs, when the wide adoption of the Internet began only in the 1990s, led by online banking which led the way for e-commerce (CIO Journal, 2015).

Therefore the introduction of BYOD, is only a matter of time until the financial sectors fully adopt this strategy or stand the risk of been regarded as technology lagers. A participant explained:

" Technology in the bank has always been about the need for it at a point in time. All my years working here I have seen trends come and go, so if BYOD is seen as the correct technology for this point in time it will be adopted by the organisation."

This indicates that beyond the benefits such as productivity improvements with BYOD, the financial sectors will have to consider how to enter and stay relevant in the world of digitalization (Thomson, 2012).

There are also reductions in the cost gained in the maintenance of the devices if the BYOD strategy is implemented. As the employees are now the owners of the devices, the cost associated with the maintenance has been transferred to them from the organization (Singh, 2012). Furthermore, it is now easier for users to switch to the latest versions of devices, meaning they do not have to wait for their employers to carry out an organization-wide update of devices. This finding is supported by a comment from one participant:

"I don't mind ensuring my device is always updated. I do this any way so if I have to do it without permission from the organization it will be fine. I love technology and tools so it would be great if the bank can catch up quickly."

This raises other benefits which are often not seen. By introducing technology quicker to this industry, it can provide a competitive advantage over others (Shim, 2013). This sector can change its perception of "old -fashioned and boring" and attract the best pool of employees straight after graduation.

In previous literature it was shown that having BYOD in the workplace helps to attract top-grade employees because it assists with flexible working times (Hensema, 2013). In addition, it was indicated that "Generation Y" employees are a driving force behind BYOD being adopted by companies. Generation Y are described as those who grew up with technology and expect to be able to use it both at home and at work (Hensema 2013, p.1).

5.3.7 Impact on workload

A number of employees view BYOD as the key to increased balance of personal and work life.

One participant described using a personal device for work and business as convenient because: *"I can keep in touch with my children and boss at the same time, which works out perfect for me"*. In contrast another participant mentioned: "*I always feel like I need to be connected, so how will my family feel when I answer emails at dinner?"*

This added flexibility of using the same platform for both personal and business uses has enabled employees to work more often out of normal business hours than ever seen before (James & Griffins, 2012). This has allowed an *"Anything, Anywhere, Anytime"* mentality to be created which has diminished the boundaries between private and professional life regarding working hours (Disterer & Kleiner, 2013) .

Mobile devices are more diverse in their individual platform capabilities; therefore, for the sake of the employees and the organization it is important to find ways to avoid burnout (Jaramillo D. K., 2013). A participant described his feelings: "*I'm so anxious about my work, so I will need to be careful not to burn out because I will always be checking my emails. I do this already just with my messaging applications."*

A previous study showed that policies on personal media use at the workplace should possibly leave enough flexibility for the individual to decide on the media and tools that he/she wished to use. It is also expected that the managers should explicitly consider the individual attitudes of their colleagues and their personal boundaries when setting this environment; the" one size fits all" approach is less likely to succeed in a BYOD environment (Schalow, 2013).

Chapter Six: Discussion and Conclusion

Based upon the findings of the analysis, the following chapter gives a brief discussion of how the analysis can help answer the research questions.

To remind the reader, the main objective of this research is: Examine the impacts of BYOD usage, focusing on the work practices in the workplace, largely the financial sector, while proposing a framework which will provide a platform to evaluate this phenomenon's implementation.

To achieve the answers to this more effectively, the research question was then extended into sub-questions:

Q1: How does the usage of BYOD impact work practices in the South African financial sector?

Q2: What are the most prominent work practices in the work place affected by BYOD?

Q3: What is the perceived impact of BYOD implementation from the employee and employer?

6.1 Implications for theory

The findings can be considered a first step in understanding the position of the financial sector where we can evaluate the impact of BYOD on work practices. The development of the proposed framework in context with BYOD focuses on six main constructs as seen in Figure 4, which shows the relationship of the different impacts caused by BYOD.

The themes identified describe situations in which concerns and possibilities about BYOD usage came to light. The possibilities are related to three main aspects: productivity increase, costs reduction, and work practice evolution. BYOD in the workplace impacts the manner in which employees work: the type of work practice, motivation from the individual, amount of work load and overall behaviour of the team using these devices. All this has an impact on the overall performance of an individual and the industry affected. Other factors affect the BYOD strategy as seen in the findings; therefore, the main themes identified will be analysed further in accordance with the proposed BYOD framework.

The themes associated to BYOD and work practices describe situations in which current work practices of daily tasks has evolved. In order to fulfil the demands of both the organization and employees, BYOD

presents new ways of doing traditional tasks with the freedom of using additional tools available via this phenomenon. Consequently, this has led to openness from the organization which can create a culture of employees who are more motivated to do more and manage work load more effectively, in turn adding more value to the workplace.

Our constructs of behaviour and motivation show a close relationship that is connected, based on the individuals' access to BYOD. It describes situations in which permission to engage in BYOD in the workplace will affect a person's behaviour. As soon as BYOD was introduced for the management team, increased productivity, flexibility and creativity were seen. This led to higher levels of motivation in the teams and in turn, additional collaboration on projects. In contrast, as soon as the wider organization was aware that BYOD is permitted only for management and executives, it affected their behaviour and motivation negatively. An increased number of devices attempted to connect to the corporate network and others managed to do so, which led to a breach of corporate policies, causing the organization to be vulnerable to a security breach.

While BYOD has shown some positives on the management and executive level of the organization, due to the way it was implemented it has also shown disadvantages, specifically for the wider organization. In some literature this type of finding also contributed to performance of employees as BYOD was seen as a rapidly becoming a constraint (Soumya & Laxmi1, 2015). The findings indicated that the lower-level employees did not have the mandate to engage in BYOD though it was found that some employees still did.

The construct behaviour therefore has a dual connotation in the framework because it addresses the positive aspects and the negative aspects which come from possible chaos at a lower level. The chaos arises as a result of users engaging in BYOD, but without permission from the IT department and with no guidance from a policy. This type of behaviour will impact the construct performance and industry describing situations where the performance associated with BYOD forces employees to unethically connect devices on the corporate network, which is a huge risk for this industry.

The construct on workload also has positive and negative impacts on the employees. While some employees see it as an opportunity; most indicated the problem of work-life balance. As soon as a device doubles as a private and professional tool it can be moved around and therefore it is present in both private and business life, as there is no clear line separating the areas (Ortbach, 2013).

This can lead to overall impact on performance and well-being of the employees, leading to Techno-invasion, defined as “the need to be constantly connected” (Tarafdar & Ragu-Nathan, 2011). For tech-savvy workers, namely the millennials, the know-how of using these devices efficiently is generally not a problem, but for other employees, normally the older generation accustomed to laptops and restricted applications, it can pose a problem.

These differences between younger and older workers with respect to BYOD adoption have been addressed, for example, by digital divide research (Rice 2003; Loges & Jung 2001). The framework shows an overall impact on performance and industry; this is because BYOD is a phenomenon that needs a different approach depending on the industry and the manner in which it is implemented. The approach will determine overall success and impact on employees, specifically their performance.

The traditional “one size fits all” policy enforcement as done traditionally will be cumbersome with BYOD. To mitigate compliance and governance issues the organization should have a clear policy stating who owns what data, and whose responsibility it is to maintain backups of data, corporate as well as private. The policy should also cover liability for loss, state whose responsibility it is to retain data recovery when it is needed, and the privacy implications of such recovery operations (Laxmi, 2015).

In addition the Interviewees described the selected approach of BYOD implementation as good and bad: good in the sense that the organization can gradually get used to this new way of working, and bad because it creates gaps among teams. Therefore, the themes of performance and industry will have to be approached uniquely depending on the environment.

In this particular study, the approach has been very cautious due to the nature of the financial sector and perceived adoption pace employees require. However, we have seen leaps of improvements in productivity due to the introduction of BYOD with the management and executive teams.

The last and main construct, work practice, refers to the manner in which employees conduct daily tasks or activities. Work practices are the main focus in our findings because BYOD is changing the manner in which people work. Our findings have indicated that it is possible to gain the benefits of

implementation; however, the approach has to be carefully designed in order to achieve desired outcomes. The current work practices will need to be re-defined to work with BYOD outputs The common work practices which will change include use of applications (Skype, WebEx, Whatsapp), delivery manner (Office-based, virtual), working hours, and communication mechanisms.

Consequently, while it was possible to match all of the derived impacts on work practices to existing IS constructs in the context of the work place, due to the multifaceted nature of BYOD it requires a multi-theoretical perspective. Hence the manner in which the framework was derived included multiple frameworks which allowed different perspectives about the strategy.

Furthermore, it was noted that application of only a mulit-faceted framework alone is not sufficient to understand the impact of BYOD on work practices because of employees' technology capabilities and because organizational governance requirements differ. Therefore, the nature of this phenomenon and the impact on the workplace can further be expanded and explored in future research.

6.2 Implications for practice

The identified framework may be used by practitioners to guide their implementation strategies with respect to BYOD in the workplace. In this context, several principles can be derived based on the identified themes.

Behaviour of employees: The freedom, flexibility, increased productivity and autonomy BYOD brings into the organization will need to be closely monitored by IT and direct line managers. Employees can either make the usage of BYOD successful or a failure (Mitchell, 2016): *" BYOD has resulted in free-for-all use of personal cloud services, external hard drives, smartphones and USBs, turning the enterprise content store into a giant, unruly jigsaw puzzle".*

However, the research revealed that it is important to define where which technology may be used in the workplace. The implementation approach has to be clear for BYOD, either organisation-wide or restricted to a small group to run as a proof of concept. Failure to do so will lead to similar findings from the research where some employees access the corporate network with their devices and ultimately cause chaos in the workplace.

Work-life balance: Nowadays people have an individual desire to integrate or separate private and work roles (Rothbard, Phillips & Dumas 2005). Such personal views should be considered by organizations. The research highlighted that this can pose a challenge for some employees and for others it is not a problem. Therefore, while the BYOD programme is rolled out acceptable usage of these devices must be defined by management in order to avoid burn-out of employees. Ideally, contact is kept to a minimum over certain periods, thereby improving both the work environment as well the employee stress levels (Ortbach, 2013).

Implications on compliance and governance: The nature of BYOD requires organizations to put in place new polices specific to this phenomenon – policies which will give guidance and support to the users of BYOD, such as how users should protect their devices, which apps they can and cannot use on their personal devices, and what users and IT should do when an employee loses a device or leaves the company. In addition, with a policy enforcement is required so the user is aware of the consequences of violating their company's BYOD policies.

Impact on way of working*:* The impact of BYOD particularly in the financial sector will bring additional work for the information technology department but will also help reduce costs in the long run. The organization will benefit from more productive employees who are reachable at any time, hence adding value to customers. The employees will have more freedom and flexibility which has been unavailable in this sector. Along with these benefits new manners of monitoring work practices will arise and the possibility of changing traditional practices in order to adapt to BYOD will be required.

Q1: How does the usage of BYOD impact work practices in the South African Financial sector?

There has been much research into the opportunities and risks of having BYOD in the workplace. Among the main advantages or opportunities being witnessed in the workplace is a rise in productivity, flexibility, increased creativity and autonomy. The management of these devices is also a big benefit for organizations. However, as mentioned and seen in the framework, BYOD has drawbacks which include work-life balance, chaos introduced due to no policies in place and effect on morale due to the manner of its implemented.

Q2: What are the most prominent work practices in the work place affected by BYOD?

The common work practices affected by BYOD include all activities that require technology in the workplace. The common practices which were identified include: the manner in which email was used on a laptop as compared to a smart device. A smart device provided more flexibility and reachability for the employee. In the findings it was shown that applications available on personal devices provided better results. This indicates that the dual use of both corporate and personal applications can be beneficial. A drawback was work practices which do not need technology: this aspect would not be affected by BYOD; however, the organization culture could change due to the introduction of BYOD.

Q3: What is the perceived impact of BYOD implementation from the employee and employer?

Organizations in this sector have not been quick in adopting BYOD in their everyday business; this has been largely due to the security threats that accompany this phenomenon. Investment is required in security awareness and information security programs for the entire organisation; this would also impact the manner in which the financial sectors operate currently. This sector has therefore been regarded as a slow adopter of technology trends, while other competitors have tried to stay ahead of the rest by implementing BYOD as a proof of concept.

As seen in the findings, this has yielded many benefits for the groups selected as part of the POC. Further investigation will need to be completed in order to see value for the entire organization. While this implementation has only been a POC, it has impacted the wider organization negatively because they are excluded from BYOD usage. The findings indicated that the larger group of users believe that BYOD will increase productivity, flexibility and allow them to work in a more autonomous way.

6.3 Conclusion

This study set out to examine the impact of BYOD usage, focusing on work practices in the workplace, largely in the financial sector. The findings show that although BYOD is a gradually being adopted in this sector, it has a restricted use for management and executives rather than organization-wide. BYOD and the identified work practices revealed that new processes and polices will need to be defined to support this paradigm shift in the workplace.

Within this research, an exploratory analysis of the impact BYOD has in the sector was conducted. We were able to identify six major aspects that may influence work practices for employees: 1) Change in behaviour; 2) Impact on workload; 3) Changes in motivation of individuals; 4) Re-definition of work practices; 5) Impact on overall performance; 6) Approach required for industry.

The common approach taken by organizations for implementation was not “Big Bang”; instead, it was rolled out to small groups within the organizations as a proof of concept. This resulted in benefits being realised only for the selected groups which were part of the POC. The majority of the organization functioned as normal, which revealed negative effects on employees who felt excluded from this new way of working. While the introduction of BYOD has had a positive impact on work practices for the POC group it also caused divisions between the management and executives.

A culture of low trust was created due to the implementation approach of BYOD, which showed that employees directly disregarded policies and security recommendations in order for their devices to be incorporated in their daily lives while at work. The impact on their work practices was found to be neutral to negative because access was not granted; while indications of possible positive benefits were recognized from the surveys and interviews, in reality it was not the case.

6.4 Future work and limitations

These are contributions that are common to this sector because the main objective was to increase productivity, flexibility and autonomy for the organization. It has actually caused new problems which disadvantaged the employees’ way of working. We were able to associate the main influences of BYOD to several related constructs in IS literature which exposed possibilities for future theory building efforts. Future studies could further elaborate upon how organizations can overcome the exclusion caused by BYOD due to the implementation style by means of suitable implementation strategy and policies. On the other hand, a major question to address concerns the positive effects of the adoption of BYOD in an enterprise context. Thus additional research is recommended about the financial sector’s implementation of policies to address issues of security, work practices and privacy concerns in their organisations as well as practices of a culture that allows for better management–employee liaisons.

The current practitioner literature about BYOD emphasizes positive aspects; this paper contributes to guidelines on how to address the different impacts of BYOD in the organization with considerations of

positive and negative outcomes. However, our findings are beset with certain limitations. First of all, the organisations involved had different maturity levels and due to the limited number of 15 interviews, it's possible that there are additional impacts associated with BYOD which weren't identified from the data.

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