



Research Report

The impact of the use of BYOD on Employees: The Case of a South African Bank

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Date: 05 April 2020

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Abstract

Traditionally, organisations provided the technology resources to their employees; the 'Bring Your Own Device' (BYOD) phenomenon has brought about a technology shift in organisations. BYOD refers to the organisation allowing employees to use their personally owned technology devices for work-related activities. BYOD has been trending as early as 2004 and research has been conducted to understand its implications and studies focused on exploring and understanding the implications of BYOD from an organisation's point of view. However, limited studies have focused on understanding the impact of BYOD from an employee's perspective creating a gap in knowledge.

This qualitative research study addressed the identified gap by exploring the impact of BYOD on employees within a financial institution in South Africa, Gauteng province. An interpretive approach was followed for this case study, and Activity Theory was used as a lens to address the following research questions:

1. What do employees of the financial institution use BYOD for?
2. What are the positive and negative impacts of BYOD for employees of the financial institution?

The employees that participated in this case study were selected using the purposive sampling method and data was collected through eight interviews. The interviews revealed that employees use several different BYOD devices for work-related activities for various purposes of BYOD use. Cell phones have been found to be the main BYOD device. BYOD was used frequently and primarily for communication purposes. Positive and negative impacts of BYOD were explored from different perspectives.

The findings of this study provide an understanding of the positive and negative impact of BYOD use by employees on the facilitation of their work within the organisation. The positive impacts to work facilitation were identified to be increased 'flexibility and mobility', better 'user experience, better 'employee interaction' and increased 'productivity'. The lack of 'organisational support' and the 'incompatibility of devices' appeared to be the negative impacts to work facilitation. The study also revealed positive and negative personal impacts of BYOD use on the employees, in this regard positive impacts included; increased 'flexibility and mobility', increased 'convenience and efficiency', greater 'autonomy', increased 'job satisfaction'. While negative impacts of BYOD use on employees were found to be; 'cost implication' concerns, 'work-life overlap', as well as increased 'anxiety' and 'privacy and security' concerns. The study suggests that the organisation encourages the use of BYOD and that the employees are more inclined to use BYOD as opposed to the organisation issued device.

The study has contributed by exploring the gap in knowledge regarding the impact of BYOD on employees within the South African financial institution. Also, the use of Activity Theory allows for the contribution to the body of knowledge as this theory has not been used as a lens in this context of the study.

Key Words: BYOD, Financial Institution, Banking sector, Activity Theory, Employee

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Acronyms and Abbreviations

Abbreviations	Description
2FA	Two-Factor Authentication
AS	Activity System
AT	Activity Theory
BYOD	Bring Your Own Device
CIO	Chief Information Officers
DOL	Division of Labour
HCI	Human-Computer Interaction
IS	Information Systems
IT	Information Technology
ITA	Information Technology Artefact
MAM	Mobile Application Management
MDM	Mobile Device Management
MIM	Mobile Information Management
TAM	Technology Acceptance Model
TTF	Task Technology Fit
RICA	Regulation of Interception of Communications and Provision of Communication-related Information Act

Definition of terms

Term	Description
Mobile devices	Refers to a small, autonomous and unobtrusive device that can be carried on one's person without hindrance at every moment. (Trifonova and Ronchetti, 2003)
Banking sector	Refers to the monetary authority, banks holding deposits, insurance corporations, pension funds, foreign exchange companies and other finance companies. (De Silva, 2016)
IT Consumerisation	Refers to a fusion of private and business life in relation to the use of technology (Gewald, Wang, Weeger, Raisinghani, Grant, Sanchez and Pittayachawan, 2017)
BYOD	Refers to organisations allowing employees to use personally owned mobile devices for work-related activities (Afreen, 2014)
Activity Theory	A philosophical and cross-disciplinary framework for studying different forms of human practices as developed processes, with both individual and social levels interlinked at the same time. (Er and Kay, 2005)
Subject (AT)	A member of a working group that performs an activity (Kaenampornpan and O'Neill 2004)
Tools (AT)	The artefact used to mediate the activity performed and these are defined in three categories (Ditsa and Davis, 2000)
Object (AT)	The target of the subject's action or the immediate goal of the activity (Kaenampornpan and O'Neill, 2004)
Rules (AT)	The regulations and norms stipulated to guide the subject regarding the activity performed (Hashim and Jones, 2007)
Community (AT)	The people who share the same problem space as the subjects in that they are also invested in the object orientated nature of the subject's Activity System (Gretschel, Ramugondo, and Galvaan, 2015)
Division of Labour (AT)	The division of tasks between the roles that perform an activity and those that influence the result of the activity performed (Kuutti, 1995).
Outcome (AT)	The outcome refers to the resulting impact of the achievement of the object. (Kaenampornpan and O'Neill, 2004)

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1. INTRODUCTION

Traditionally, organisations provided the information systems/information technology (IS/IT) resources, for operational use, to their employees (Mahindru, 2013). For some organisations, desktop computers were the resources assigned to employees (Er and Kay, 2005); however, technology in the office continues to evolve, and the employees have seen a change in the technology accessible to them. For example, desktop computers are replaced by mobile devices (AICPA, 2012).

Berl and De Meer (2011) describe mobile devices as having the ability to access advanced mobile features and services that are usually not available to desktop computers. Trifonova and Ronchetti (2003) define a mobile device as a small, autonomous and unobtrusive device that can be carried on one's person without hindrance at every moment. Mobile devices are readily available to individuals and research has seen an increase in the use of such technologies (Nascio, 2012). The use of mobile devices has extended information access as well as collaboration outside the office (Suchman, 1997). Individuals have easier access to mobile devices, from both the personal and organisational perspective. Research highlights that this ease of access influences the individual's level of comfort and confidence when using mobile devices as they are familiar with the devices (Hillard, 2017). According to Mushi (2018), the perceived low cost, mobility, and the fact that mobile devices are easier to learn drives their high adoption by employees and organisations.

While in some organisations the adoption of technology has been driven by managers (on behalf of the organisations) technology advancements have brought about a shift whereby employees are now able to drive the devices adopted within an organisation (Adedolapo and Kabanda, 2016). According to Gregory, Kaganer, Henfridsson, and Ruch (2018), employees play a key role in today's organisation and the drive as to which technology to use for work activity. French, Guo, and Shim (2014) state that while organisations assign mobile devices to employees for work-related activities, the employees may prefer to use personal devices. Organisations have recognised the shift in how technology is accepted within the organisations and studies have been done to understand the implications of allowing employees to use their personally owned devices for work purposes (Lee, Warkentin, Crossler, and Otondo, 2017).

The banking sector is no exception to the BYOD phenomenon. De Silva (2016, p74) defines the banking sector as a “monetary authority, banks holding deposits, insurance corporations, pension funds, foreign exchange companies and other finance companies”. Gustav and Kabanda (2016) suggest that BYOD in the banking sector exists to add value to the employees’ ability to perform tasks. However, the heavy regulations that guide the banking sector (French et al., 2014), makes it difficult to formalise the BYOD use strategies (Waterfill and Dilworth, 2014). In their study Gustav and Kabanda (2016) found that from the organisation’s perspective, the continuous changes in government regulation regarding the use of data is a hindrance to the formalisation of BYOD.

This study investigated the tasks for which employees, in a South African bank, use BYOD. Aside from their intention to accommodate the needs of employees who wish to use BYOD, the bank facilitates the use of BYOD as a step in the process of encouraging the use of a mobile staff administration app that will be deployed for BYOD use. Getting employees to use this app will promote a single view of the individual in the organisation.

Having explored the use of BYOD in the bank, the study further explored the impact that using BYOD has on the employee. With BYOD the choice of technology remains with the employee and literature shows that individuals adopt mobile devices such as laptops, tablets, smartphones (Gustav and Kabanda, 2016) or iPads (Aldhizer III and Bowles, 2011) as the preferred BYOD tools. The scope of this research is not restricted to the devices mentioned above. BYOD in this study, refers to any personally owned smart device that bank employees use for work-related purposes.

1.1 Personal Rationale and Problem Statement

In this study, the researcher will bring to light the impact of BYOD use on the employee in a South African bank. While the BYOD is a phenomenon that many organisations have formally adopted, some organisations acknowledge its existence but have not formalised its use. This research is based on a South African bank which allows for the use of BYOD. While BYOD has not been formally adopted at the bank, and no BYOD policies have been communicated to the employees, there are certain expectations that the employee needs to fulfil in order to use BYOD. Currently, at the bank, BYOD is primarily driven by the employees who use personal devices to perform tasks such as accessing emails.

In most cases, to get access to the bank's systems the employee has to login using their secure login credentials, for example, to access work emails the employee needs to download Microsoft Outlook and log in using the same username and password they use for logging onto the bank assigned device (laptop). To maximise the use of BYOD the bank encourages, but does not enforce, the use of the two-factor authentication (2FA) applications for access to secure platforms such as the systems and servers. The 2FA process combines a password (knowledge-based) and keystroke dynamic (biometric-based) features (Olalere, Abdullah, Mahmod, and Abdullah, 2016). In this instance, the employee is expected to download an authentication application that has been approved by the bank. Considering that BYOD is a known phenomenon at this bank, the bank is best positioned to provide the required data for this study.

In their study, Doargajudhur and Dell (2018) suggest that while research has identified a demand for BYOD as driven by employees, the employees have recognised some risks to themselves associated with BYOD. No studies have been found focusing on BYOD use from the employees' perspective. Studies have been conducted to understand the advantages, disadvantages and impact of BYOD use with the focus on the organisation's perspective. Kabanda and Brown (2014) conducted a study on BYOD use focusing on the impact from the organisation's perspective as such they did not investigate the BYOD use from the employees' perspective. This is a gap in knowledge, and risks affecting the employee have been identified, including security threats, legal and regulatory issues as well as issues relating to data accuracy. These risks are not fully understood, or there is a lack of knowledge as to how they can be addressed. The lack of knowledge regarding the impact along with the gap identified in the literature, has highlighted the need to explore the impact of BYOD on employees in this financial institution (Disterer and Kleiner, 2013).

A better understanding of the impact of BYOD use on employees could enable better decision making regarding the technology used in the organisation. Also, this knowledge could ensure that the needs of both the organisation and the employee are considered where the boundaries and policies of BYOD are defined. Being aware of the use of BYOD in the bank, the researcher understood the need to explore the possible impacts of this use would be on those employees who had decided to use it, and felt that it was a worthwhile phenomenon to explore in this study.

1.2 Significance of the Study

Research by both practitioners and academics has been focused on realising the implications of BYOD from the organisation's perspective (Weeger, Wang, and Gewald, 2015; Ellis, Saret, and Weed, 2012). Studies have been conducted to understand the advantages and disadvantages of BYOD to the organisation and employees, but the focus is primarily on the organisation (French et al., 2014; Olalere et al., 2016).

Many of the academic studies conducted focus on the BYOD issues and risks around data and network security, the impact that BYOD has on costs to the organisation as well as how these could be mitigated (Lee et al., 2017). In their study, Disterer and Kleiner (2013) confirm the security concern regarding this phenomenon, highlighting that BYOD users represent a significant weakness to security. Disterer and Kleiner (2013) continue to highlight a knowledge gap indicating that, more so for developing countries, there is a lack of understanding of the BYOD phenomenon. Researchers have supported this view indicating that there is a need to understand how employees perceive their personal mobile device usage in the workplace (Twinomurinzi and Mawela 2014; Jeong, Lee and Nagesvaran 2016).

According to Twinomurinzi and Mawela (2014), the formal adoption of BYOD in the context of South Africa is happening at a slow pace. This slow progress has been discussed by Disterer and Kleiner, (2013), suggesting that it is due to the lack of adequate research done on BYOD within this context.

Within the South African context, BYOD has been studied but not to great lengths (Twinomurinzi and Mawela, 2014). This study, therefore, explored a BYOD implementation in an organisation within the South African financial (banking) sector, where employees use their personal devices to perform work-related tasks. An example of this is where the employer has successfully introduced the two-factor authentication process for security access to a certain work-related system; for this, the employees use their personal mobile devices. How the employees are impacted by the implementation of BYOD is not fully known (Yin, Liu, and Liu, 2014) and more so in the context of this study.

1.3 Purpose of the Study

In the section above a gap in knowledge around the BYOD phenomenon has been identified, indicating firstly that there is minimal research undertaken to understand what BYOD means for the employees that are using it, and secondly that little research has been done in a South African context. This study is aimed at addressing the gap in knowledge by exploring the impact that BYOD use has on employees within a financial institution in South Africa, Gauteng province, through attempting to answer the below-stated research questions:

- 1) What do employees of the financial institution use BYOD for?
- 2) What are the positive and negative impacts of BYOD for employees of the financial institution?

1.4 Assumptions and Delimitations of the study

This study focused on employees from only one financial institution - a South African bank. Employees invited to participate in the study were using BYOD and it was assumed that they had the necessary experience to adequately respond to the research questions. The sample was engaged from the bank's head office and no branch office employees were interviewed.

1.5 Summary and Report Structure

This section provided a background into the BYOD phenomenon as well as the purpose and significance of the study. It introduced the concepts to be discussed in the sections to follow and highlighted the context in which this phenomenon was explored. The remainder of this research report is organised into chapters as follows:

Chapter (2) provides a review of existing literature on the BYOD phenomenon highlighting how it is adopted into organisations. Chapter (3) details frameworks considered for this research as well as highlighting how the selected framework will be applied in this study. Chapter (4) presents the research approach guiding the collection and analysis of data, including all ethical considerations. Chapter (5) documents the findings of the study based on the interviews conducted during data collection. Chapter (6) provides a discussion and the interpretation of the findings. Lastly, chapter (7) summarises and concludes the research report, providing the relevance of study, contributions, limitations as well as potential areas of study for future research.

2. LITERATURE REVIEW

In this chapter, existing literature, relevant to the current study, will be reviewed in order to understand BYOD. The focus will be drawn on studies that have explored BYOD as an artefact as well as studies that have focused on the use and impact of an artefact. This chapter is structured as follows: firstly, literature relating to mobile devices and BYOD is explored in an attempt to understand BYOD. Thereafter, studies in the literature are discussed to understand use and impact of BYOD as a phenomenon. Lastly, a summary of the existing literature is provided, highlighting the gaps in knowledge specifically from the perspective of the employee.

2.1 BYOD – Bring Your Own Device

Technology is evolving and organisations recognise the need to constantly adapt to ensure that they remain competitive in their respective industries. Mitra (2005) supports the adaptive nature of the organisations highlighting that technology is a strategic resource and a growth enabler. Contributing to the growth enablement, traditional technology resources such as desktops have been replaced with mobile devices (Barmpatsalou, Cruz, Monteiro, and Simoes, 2018). Mobile devices refer to hardware technologies such as laptops, tablets, iPads, and smartphones (Gewald, Wang, Weeger, Raisinghani, Grant, Sanchez and Pittayachawan, 2017; Aldhizer III, and Bowles, 2011). Friedman and Hoffman (2008, p161) defined mobile devices as “portable electronic systems that store and manipulate potentially confidential information”. According to Corral, Janes, and Remencius (2012), these mobile devices allow individuals the ability to perform various capabilities including communication, entertainment and business. South Africans are reliant on mobile devices, whether it is for personal or work-related purposes (Anon, 2017).

BYOD is an emerging trend in the world of technology (Tewari, Nagdev and Israni, 2015; Singh, 2012), trending at an exponential rate (Bouk, 2017; Cooper, 2018), and users are more aware of the latest and best mobile devices available in the market. According to Swoyer (2012), the mobile workforce was projected to account for 1.3 billion workers by the year 2015. TelecomTiger (2014) concluded a forecast in the Asia/Pacific region that suggested the BYOD growth to be 155 million in 2014. The forecast also supported Swoyer’s projections that BYOD growth would continue well into the year 2015.

As an emerging trend, the need to understand BYOD and the impact it had on businesses as well as employees became apparent. Research suggests that BYOD has been around since as early as 2004 (Niehaves, Koeffer, Ortbach, and Stefan, 2012). It was around the years 2012-2015 where the phenomenon took focus in both the practitioner and academic communities. In 2014 research done on BYOD increased, this could be attributed to the increase in the use of BYOD, which was predicted to reach a significant 350 million devices used worldwide (Scott, 2014). From an academic perspective 2014 was rich in BYOD studies seeking to understand this phenomenon and the impact thereof.

While BYOD has been researched for years, studies conducted to investigate the extent to which BYOD is embraced is minimal (Gupta, Bhardwaj, and Singh, 2019), this highlights the need to further study this phenomenon. In their study, Twinomurinzi and Mawela (2014) stated that little is known about the degree to which South African organisations embrace BYOD. Farrell (2014), suggested that while technology is believed to address many concerns in an organisation it is important to ensure that the human input to the use of these technologies is given much consideration. The need to further explore the employee's perspective for using BYOD is also supported by recent studies (Gono, 2019).

BYOD refers to organisations allowing employees to use their personally owned mobile devices for work-related activities (Afreen, 2014). This definition is extended by Ballagas, Rohs, Sheridan, and Borchers (2004) who suggest that BYOD includes access to and sharing of organisational information. Ogie (2016), suggests that the term BYOD should not only focus on the technology but all concepts and policies which need to be in place to guide the implementation of BYOD. The use of BYOD as a phenomenon within organisations can be driven by either the employees or the organisations. In one view, as stated by French et al. (2014), employees lead organisations to formally adopting BYOD into their business strategy. This is a result of employees insisting on bringing their own devices and performing work activities without or without adopting or aligning to organisational policies.

In a study, Ortbach (2015), highlights that many studies indicate that BYOD is about the user's behaviour. Eddy (2013) published a report on eWeek, stating that employee behaviour indicates that BYOD will continue to trend within organisations. The report found that, similar to the use of mobile devices assigned by the organisation, 67.8 percent of full-time United States employees use their personal smartphones for work purposes. In addition to this, 15.4 percent of these employees do so without informing the IT department, while 20.9 percent of those do so regardless of anti-BYOD policies adopted by organisations. This report supports the notion that BYOD drives IT self-sufficiency among employees.

2.2 Current BYOD Use

According to Crossler, Long, Loraas and Trinkle (2014) BYOD is becoming a norm rather than an exception for the devices used by employees for work purposes. This is supported by Ostermann, Wiewiorra and Franzmann (2017) who suggest that accessibility to mobile devices continues to increase. According to Gewald et al. (2017) the use of BYOD within organisations is expected to continue growing. The need to adopt mobile devices is recognised within organisations as a strategic trend (Disterer and Kleiner, 2013). The use of BYOD allows a unified communication strategy, this strategy aims for better employee communication by supporting easy access to emails, calendars and verbal communication (BCX, 2016).

Melitz (2003) expands on this highlighting that, depending on the employee role, the purpose for which employees use BYOD varies from one employee to the next. For example, while everyone has access to their emails, the management level employees can perform approval tasks on their mobile devices from anywhere and at any time.

In their study Lu, Lin, and Yueh (2018) indicated that a key factor in the successful use of mobile devices in the workplace is the employee's acceptance as well as an understanding of their needs and usage preferences. Kabanda and Brown (2014) also suggest that BYOD use is driven by user preferences, and leads to employee satisfaction and improved productivity.

2.2.1 BYOD Use and Security

The use of mobile devices in general - and BYOD in particular - has raised concerns about the security of organisation's information. As such organisations implement security policies to protect their data. Some organisations have formalised the use of BYOD by implementing guiding policies and security measures to guide employee use of BYOD. Eslahi, Naseri, Hashim, Tahir and Saad (2014) have indicated that there are three main security models that may be considered for BYOD policies. These security measures include:

Mobile Device Management (MDM), which focuses on the management of the device. According to Smith (2017) MDM states that employees need to register all devices that require access to the organisation's network and information access would then need to be approved by the organisation. Eslahi et al., (2014) suggest that MDM systems allow for the remote monitoring of mobile devices for function control, where the organisation has the ability to lock down certain functionality such as the ability to copy and paste. MDM allows the organisation access to private and sensitive information such as personal emails, personal passwords to apps existing on your device and browsing history (Francis, 2017). Ogie (2016), conducted a study to identify commonly adopted BYOD solutions and highlighted their limitations, remedies as well as relevant policy considerations. The study found that many organisations adopt MDM, however, considering the associated limitations it was concluded that the 'application and desktop virtualization' solution is more "privacy friendly" (Ogie, 2016, p118).

Mobile Application Management (MAM), focusing on manage the applications found in the device. MAM is applied to specific applications on a device rather than the entire device. The MAM system provides IT administrators the ability to monitor and control organisation related applications on mobile devices (Tewari et al., 2015). This is supported by Scarfo, (2012) in a survey-based paper aiming to detail methods and models on how to approach the BYOD phenomenon from the security point of view.

Mobile Information Management (MIM), which aims to protect the organisation's information. According to Scarfo, (2012) MIM is about securing information, files and documents stored in cloud-based services. MIM ensures that the organisation information is protected by focusing on data integrity and encryption as well as ensuring document synchronization of data located in a cloud server and accessed amongst multiple devices (Downer and Bhattacharya, 2015).

As defined above these security models focus on different aspects of mobile device security, Ogie (2016) has suggested that MAM and MIM are variants of MDM. In their study, Yamin and Katt, (2019) suggest that the MDM is seen to be a benefit to organisations, however, it is found to affect employee privacy. As stated by Smith (2017, 406) employee's personal data could be "subject to exposure, alteration, or deletion" as a result of the organisation having applied MAM.

While security measures are implemented by organisations, the measures seem to benefit the organisation more than the employees. Weeger, Wang, and Gewald, (2015) suggest that balancing organisational security and employee privacy is a challenge and this imbalance could have a negative impact in employees adopting BYOD. Literature has been conducted to understand why employees adopt BYOD policies defined by organisations. According to Callies, Noteboom, Talley, and Wang (2019) employees are more willing to accept and adhere to security policies implemented for BYOD when they know that other employees are accepting of the policies.

2.2.2 BYOD in Banking Sector

To investigate BYOD use in the banking sector it is important to understand the impact of technology in the sector. The banking sector is crucial to the economy of a country (Kalra and Jain, 2018) it is therefore important that the banks continue to work towards gaining a competitive advantage (Chaturvedi, Dhingra and Kaur, 2018). The evolution of technology has seen many organisations embracing the digital platforms (Luna-Reyes and Gil-Garcia, 2014) and this is no different for the banks. Digitisation is increasing and Fellenz, Augustenborg, Brady, and Greene (2009) indicate that the value brought about by technology in the banking sector is often not acknowledged from a financial perspective. While the value is not recognised from a financial perspective, Siddique et al., (2018) contend that technology does influence organisational success. Mohamed, Ngui and Mulili (2017), highlight that with the fast-changing technology it is important for banks to ensure that the technology resources provided to employees are always up to date with what is trending in market and according to Mohamed et al., (2017) BYOD would alleviate this pressure from the employer to the employee as updates would be the responsibility of the employee on their personal devices.

Literature on BYOD use in the context of the banking sector is limited (Gustav and Kabanda, 2016), even more so on the impact of BYOD use on employees. Bank employees are found to be embracing the use of BYOD for their day to day tasks as BYOD continues to make headway into banking (Ginovsky, 2012). As stated by Singh (2012), good opportunities can be realised by the banking sector if the BYOD phenomenon was to be adopted.

As recorded by Engineer IT (2018), the nature of the industry has an influence on how employees use BYOD. The use of BYOD by employees in small to medium enterprises is seen to be less risky than in industries such as the banking sector. The banking sector is seen to be riskier due to the highly sensitive nature of information stored and processed. According to Koesyairy, Kurniawan, Hidayanto, Budi, and Samik-Ibrahim (2019), BYOD use in banks can be a threat to company data. Rigorous governance and security measures must thus be in place to ensure that this information is protected (French et al., 2014). For this reason, technology adoption needs to be guided by strong policies (Lu et al., 2018). While regulations and policies can be implemented, employee awareness of and training for these is essential. This supported by Crossler et al. (2014), who in their study found that there is a need for employee awareness and training is to encourage BYOD policy compliance by the employees. Employee awareness of the sensitive nature of the data, as well as the impact on employees of enforced security measures, are therefore important factors to consider when exploring the use and impacts of BYOD, making the banking environment an interesting context for this study.

2.2.3 Purpose of BYOD use

In order to understand the impact of BYOD use on employees, it was important to know what work-related activities the employees perform using BYOD. Some organisations equip employees with mobile devices, mostly laptops, to achieve work-related activities. However, many organisations are faced with the realisation that employees bring their personal mobile devices to the office and use these for work-related activities. In their study Ostermann and Wiewiorra (2016) found that the factors driving the employee's decision to participate in BYOD can be grouped into three categories. These include the employee's preference for using one device which is influenced by the desire to "carry, manage and maintain only a single device for work and private use" (Ostermann and Wiewiorra 2016, p6); the employee's preference for using their own device based on the preferred technology device; as well as the employee's personal characteristics which look at what they perceive to be benefits of using BYOD. Studies have shown various uses of BYOD in the workplace, these are discussed in more detail below.

According to Luttenegge (2010), the most common work-related activities that employees perform on their mobile devices include the sending and receiving of private and work emails, conversations, internet access and the creation or editing of documentation. These activities can be achieved using the organisation issued mobile device.

Email Access: According to Yeboah-Boateng and Boaten (2016), the use of BYOD for email access can be traced back to the early 2000s where Blackberry provided employees with the ability to connect to company networks for easy access to emails and calendars. In their study, Meske, Stieglitz, Brockmann and Ross (2017) concluded that employees adopt the use of BYOD to access work-related emails with a positive attitude.

Social Networking (WhatsApp Messenger): Based on 2018 statistics, DataReportal reported that WhatsApp is the most used social messenger around the world. Many work teams have adopted WhatsApp as the means of communication between the team members and this is primarily achieved by using smartphone devices (Veljkovic, 2018). This allows the team to communicate urgent messages, bounce off ideas or set up meetings.

Document storage, retrieval and sharing: According to Mahatanankoon (2015) BYOD allows for many benefits, one of which is a perceived sense of personal freedom as employees have access to the organisation's network because of BYOD. BYOD gives the employees the ability to store, retrieve and share work-related documents (data) over the organisation's network. According to Garba, Armarego, Murray, and Kenworthy (2015), personal devices do not necessarily have the best security measures in place compared to the devices owned by the organisation. Resulting from the lack of security and the fact that these devices are easily stolen or lost; the documents stored and shared on BYOD can be exposed to data leakage (Tse, Wang and Li, 2016). In instances where the device is compromised the organisation can wipe it clean, resulting in the employee losing both work-related and personal data (Garba et al., 2015).

Web Conferencing: Employees have access to organisation approved applications such as Skype, WebEx and GoToMeeting (Kerravala and Michels, 2015); these applications provide employees with the ability to facilitate team meetings. According to Kerravala and Michels (2015), video communication requires real-time participation from all members involved. BYOD provides mobility and agility, allowing the employees the ability to conduct work-related video and audio calls anytime, anywhere. Davis (2017) highlights that BYOD might not have features (such as cameras, microphones and speakers) that are at a quality level that can help facilitate a meeting.

Two-Factor Authentication: (2FA) originally existed in the form of tools such as smartcards and physical tokens. These tools have since evolved, users are now able to authenticate on their mobile devices (Weidman and Grossklags, 2017). Some organisations have adopted 2FA as a security measure for employees who wish to access specific applications on the organisation's network (Ni, Lin, Zhang, Yu and Shen, 2016). BYOD is used to perform this authentication on approved applications that the employees are expected to install onto their devices. According to Colnago, Devlin, Oates, Swoopes, Bauer, Cranor and Christin (2018), BYOD use is not without user concerns. In their study Colnago et al. (2018), found that user concerns relate to scalability, general ease-of-use, and ability to recover from failure or factor loss through 2FA.

As discussed in this section employees use BYOD to facilitate a number of work activities, these purposes were identified by Luttenegge (2010) as the most common purposes, it is, however, important to note that there might be uses of BYOD. While these work-related activities could be achieved using organisation issued devices, BYOD use is found to have positive and negative impacts as discussed in the following sections.

2.3 Impacts of BYOD use

Many organisations choose not to assign desktop computers to their employees for work-related tasks as they have realised the benefits of using mobile devices (Kabanda and Brown, 2014). According to Cidon (2015), BYOD appeal is growing within the workplace and the benefits to the organisation are found to be significant. In their study, Waterfill and Dilworth (2014) suggested that as a result of BYOD use organisation experience benefits such as: decreased costs of technology, and attractiveness of the employer to job seekers. BYOD use does not come without disadvantages as reported in the Government Technology (2014), security concerns around BYOD are at the forefront for many IT managers and these concerns need to be addressed through formalised policies while supporting the need to invest time in understanding the implications of BYOD.

Based on literature, this section details various impacts of BYOD use on employees.

2.3.1 Employee Efficiency

As mentioned by Leclercq-Vandelannoitte, (2015) employees desire to be more efficient at their work and according to French et al., (2014) BYOD use positively affects employee efficiency. Olalere et al., (2016) suggest that the positive impacts of employee efficiency are experienced by both the employer as well as employees. In their study, Waterfill and Dilworth (2014) deduce that employees are happier when they use applications that they like and know, increased happiness is associated with increased employee efficiency.

2.3.2 Employee Job Satisfaction

Some research views job satisfaction as it relates to the salary given to the employee (Peiro, Agut and Grau, 2010; Alavi, Askaripur, 2003), however the salary is not the only influencing factor. In their study, Garba et al. (2015) highlighted that employees could be willing to commit to lower-paying jobs if the organisation provides the latest and greatest technologies, else allows for BYOD. Junglas, Goel, Ives, and Harris (2019) support this statement adding that if guided by policies, BYOD can result in higher levels of innovativeness and job satisfaction among employees. According to French et al. (2014) BYOD use could have positive impact on employee satisfaction.

2.3.3 Employee Autonomy

Garba et al. (2015), suggest that BYOD use allows freedom to the employees. The employees have the independence to decide on what devices they want to work on, with the technology specifications that they define and within their budget (Munroe, 2013). BYOD use is a positive influence on self-responsibility and autonomy of employees (Ostermann and Wiewiorra, 2016). According to Calvard (2019) when employees experience autonomy which could have a positive impact on employee well-being.

2.3.4 Employee Productivity

According to Chang, Ho, and Chang, (2014), productivity is understood as being the biggest benefit of BYOD. Other studies show that the BYOD phenomenon brings about increased productivity for both the employees and the organisation (Lebek, Degirmenci and Breitner, 2013; Brodin, 2016). Since individuals use personal devices, they are more familiar with the operating systems and thus more comfortable working on them (French et al., 2014). Singh (2012) suggests that improved productivity results from BYOD encouraging comfort. This is supported by Evans (2013) who indicated that employees experience increased levels of productivity when they are more comfortable and happier and thus work faster as a result of BYOD use. In their study, Magruder, Lewis, Burks, and Smolinski (2015) also advise that better user experience results in increased employee productivity.

BYOD also allows employees a level of flexibility and mobility; however this benefit is not unique to BYOD as it could be experienced from mobile devices assigned by the organisation. Mobile devices allow the employee the ability to work at their own leisure, anywhere and at any time (Gens, Levitas, and Segal, 2011; Garba et al., 2015), allowing for improved employee productivity levels. In the case that this is the employee's personal device linked to the organisation's network, the employee would have access to organisational information as and when they need it allowing them to produce work results timeously. This can include access to emails or organisational information stored in a cloud space.

Problems with technology, however, could result in a decrease in productivity. Poor quality devices could affect how employees using BYOD perform their work-activities. Research suggests that poor device capabilities (Davis, 2017) or poor connectivity (Stąpór and Laskowski, 2016) can introduce interruptions in communication. According to Rahaman (2015) employees that use BYOD for purposes such as video or audio conferencing can experience challenges such as interruptions in real-time communication. Any hindrance to communication can result in frustrated employees as there is a possibility that work tasks are misunderstood with employees producing incorrect and inaccurate results.

2.3.5 Employee Privacy

The Regulation of Interception of Communications and Provision of Communication-related Information Act (RICA) states that the employer has the right to monitor and intercept all communication by employees, where the communication was carried out during business (Government Gazette, 2003). The monitoring of emails and WhatsApp messages raises a question regarding employee privacy as the employer will have access to all emails and messages on all devices connected to the organisation's network. As a result of this monitoring ability employees using their personal devices are found to be cautious regarding the content that they store or share on their devices. Information privacy has been defined as an individual's ability to have control of or influence on their information (Bélanger and Crossler, 2011; Jin, 2016).

Adedolapo and Kabanda (2016), highlighted that employees were concerned about how their privacy will be compromised as there is no rule formally put in place to ensure that their personal information remains private. Organisation policies that could possibly affect the employees were identified by Eslahi et al. (2014), to include; Mobile Device Management (MDM), management of the device; Mobile Application Management (MAM), management of applications; and Mobile Information Management (MIM), protection of organisational information; these policies have been detailed in section 2.2.1

2.3.6 Employee Attitude

According to Bai, Han, and Harms (2016), personal animosity leads to employee conflicts, which in turn negatively influences employee performance. In their study, Weidman and Grossklags (2017) investigated employee concerns regarding BYOD use from a two-factor analysis functionality perspective. Their findings revealed that setting up and using 2FA, in some instances, results in employee animosity directed at organisational administration and the authentication application itself and this can result in frustrations experienced by the employees.

Organisations are not responsible for the purchasing and maintenance of personal devices (Weegee and Gewald, 2014). As such, all costs associated are the sole responsibility of the employee, even though for eight hours, sometimes more, in a day this device is used for work-related purposes. The employee can access organisational information from anywhere and at any time, this blurs the line between work and private life.

Mitrovic, Veljkovic, Whyte and Thompson (2014), expressed that the lack of boundaries leads to a decrease in the quality of one's personal life. Schalow, Winkler, Repschlaeger, and Zarnekow (2013) propose that the blurring of the boundaries impacts the employee's attitude.

Employee workload is found to also have an impact on employee attitude. If processes are not clearly defined for BYOD on both the organisation's and the employee's responsibilities, then the employees might find themselves in a situation where the workload is not properly monitored and recorded (Adedolapo and Kabanda, 2016). This can lead the employees to feel resentment towards their employers, impacting the relationship. The notion of being flexible and mobile might be a benefit, but this is only to an extent.

2.4 Summary

In summary, the literature on the BYOD phenomenon has revealed that the use of mobile devices in organisations is widely adopted. Organisations have shifted from assigning desktop computers and are opting for laptops. Many employees have opted to use their own devices for work purposes, and the BYOD phenomenon. Organisations and employees have realised the benefits of BYOD use. BYOD does pose a security challenge for organisations (particularly those in the banking sector where data is highly sensitive). As a response, strong policies have been introduced which can negatively impact on BYOD users. BYOD devices were found to be used mainly for communication, but also for document management, web conferencing and two-factor authentication. Impacts of BYOD use on the employee discussed in the literature included greater employee efficiency, increased job satisfaction, increased autonomy, increased productivity, implications for employee privacy and effect on employee attitude.

The following chapter draws focus to the conceptual framework that best assists in addressing the defined research question in the context of this study.

3. CONCEPTUAL FRAMEWORK

This section will discuss the theories and methodologies that have been considered and adopted to support this study and a conceptual framework will be derived. According to Hills and Gibson (1992), a conceptual framework can be associated with the phrase ‘social system’ which refers to the interaction between the elements of a society (Parsons and Kroeber, 1958). Sinclair (2007) defines a conceptual framework as a collection of concepts that, together, provide an inclusive understanding of a phenomenon. The conceptual framework adopted for this study was derived from literature, and various concepts will be investigated in order to explore the BYOD phenomenon in the context of this study.

According to Goodhue and Thompson (1995), the association between IS and individuals performing tasks has been of concern to researchers, where some studies have focused on understanding the individual’s attitude and behaviour when performing these tasks. Goodhue and Thompson (1995), further highlight that researchers have adopted different frameworks to address this association from different perspectives. Task Technology Fit (TTF), Technology Acceptance Model (TAM) and Activity Theory (AT) were considered as possible frameworks to be adopted as the lens for this study. Based on the context of this study, the capabilities and limitations of each framework were assessed, and the most appropriate was then selected.

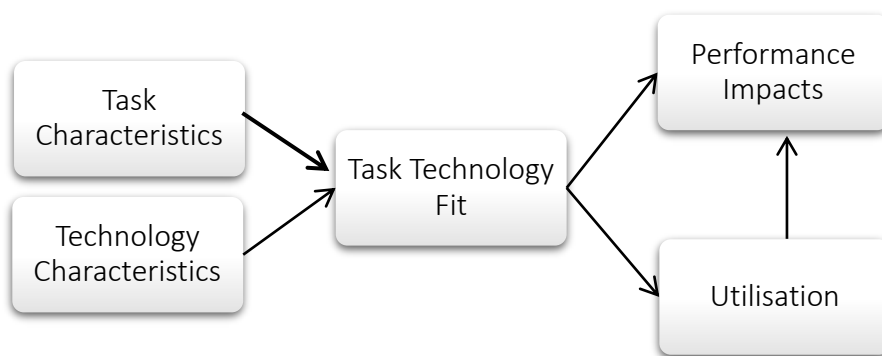
3.1 Task Technology Fit

TTF model was developed by Goodhue (Lepanto, Sicotte and Lehoux, 2011). TTF is defined under fit analysis (Wu, Kao and Shih, 2018) which seeks to describe performance. TTF refers to the ability of IT/IS supporting a task performed by the user and how that technology fits into the specific task requirements (Aiken, Gu and Wang, 2013). The TTF model is composed of the following constructs:

Task characteristics which are the behavioural requirements that individuals need to complete a set goal (Fuller and Dennis, 2009). **Technology characteristics** refers to the artefacts, such as computer hardware or software as well as support services like training, used to complete a task (Park, 2019). **Task-technology fit** refers the technology best helps the user in performing the set task (McCarthy and Claffey, 2005). **Performance** refers to the accomplishment of the task by the individual (McCarthy and Claffey, 2005). **Utilisation** refers to the “quality or usefulness” (Goodhue and Thompson, 1995, p216) of the technology as well as the individual’s attitude towards using it.

As found by McCarthy and Claffey (2005), in their study to evaluate factors contributing to the successful use of a data warehouse application, utilisation is high when the use of the technology is important to the user. As depicted in Figure 1, TTF contends that task-technology fit has an impact on (individual or team) performance, Goodhue and Thompson, (1995) express that the stronger the fit the higher the performance impact which together with utilisation are dependent on the task and technology characteristics involved.

TTF provides a strong basis for understanding how an individual's performance is increased when the IS provides the features that fit the requirement of the task (Irick, 2008). In their study, Lepanto et al. (2011) highlight the importance of Utilisation in measuring the performance impact. Utilisation is based on the individual's behaviour, beliefs and attitude when making use of the technology. Goodhue and Thompson (1995, p218) suggest that performance impact refers to "the accomplishment of a portfolio of tasks by an individual".



Source: Goodhue and Thompson, (1995)

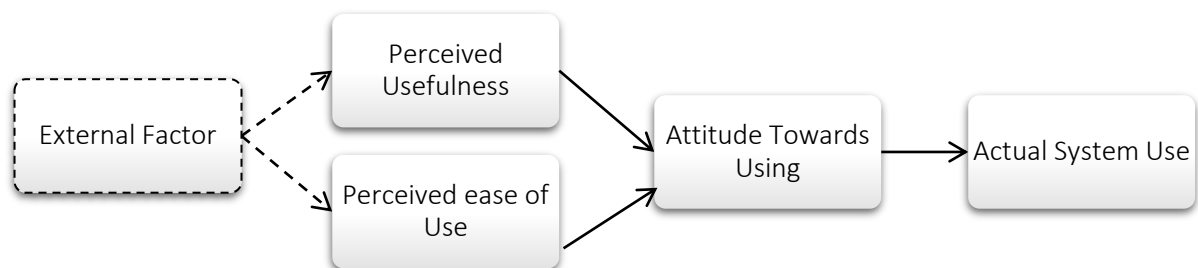
Figure 1: Task Technology Fit

According to Goodhue and Thompson (1995), the focus of TTF is on the association between task requirements, user's abilities, as well as the functionality of the technology. TTF seeks to describe performance through the use of technology. Zigurs and Buckland (1998), conducted a study on TTF in group support systems (GSS) environments and found that the model best assisted in the study as it allowed to draw insight into the attributes of task complexity, defined dimensions of the technology as well as the ability to embed TTF as a part of contextual variables such as use and adoption of the technology over time.

This study aims to explore the impact of BYOD on employees, and not simply the measure of performance. Also, the work-related tasks performed by the employees in are as well as the timeframe on the use and adoption of BYOD is not defined for this study. Tasks and experience in use and adoption might differ from one employee to the next as such TTF is not the appropriate framework for this study.

3.2 Technology Acceptance Model (TAM)

TAM was developed in 1986 by Davis with the aim of fulfilling two objectives: (1) improving the understanding of user acceptance processes which would provide insights into successful IS designs and implementations; (2) determining a practical methodology for user acceptance testing to enable system evaluations before implementation (Davis, 1986). The primary technology acceptance measures are 'use of use' and the 'usefulness' of technology (Oye, Iahad and Rahim, 2014). TAM is the most widely applied theoretical model for studies within the IS field (Lee, Kozar and Larsen, 2003) was adopted from the Theory of Reasoned Action (Oye et al., 2014). The model depicted in Figure 2 contends that individuals choose to use or not use a system based on whether they believe it will help them perform their tasks better and that the level of complexity in using the system also contributes to the ultimate use. Davis (1989), refers to the perceived usefulness as user's belief that the system will help them and that perceived ease of use is a view of system complexity.



Source: Davis (1986)

Figure 2: Technology Acceptance Model

TAM has proven to be effective in enabling researchers to predict user acceptance and usage behaviour (Davis and Venkatesh, 1996), thus providing a means of predicting the adoption and voluntary use of technology (Rauniar, Rawski, Yang and Johnson, 2014). In their study, Williams, Rana and Dwivedi, (2012), found that the TAM model is best to be adopted when the objective of the study is to understand and explain user behaviour.

The theory does not allow for the opportunity to address how other users influence an individual's attitude towards the use of IS (Rauniar, Rawski, Yang and Johnson, 2014). In addition to this limitation, TAM does not provide insight as to what the impact of actual use is on the user. Considering that the study looks at employees who are using BYOD, TAM does not meet the needs of this study.

Dishaw and Strong (1999) state that TTF and TAM are models of IT utilisation behavioural and have been widely accepted in IS studies; advising that they were developed to enrich the understanding of the choices and evaluations made by users in relation to IT. This study looked beyond the performance impact and use of the technology, the focus will be on the impact of use on the user. Considering the context of this study, TTF and TAM were found not to be the appropriate research lens.

3.3 Activity Theory

AT has evolved over three generations; each generation is an extension of the theory. According to Kaptelinin, Kuutti, and Bannon (1995), AT is based on Marxist philosophy resulting from a drive to develop new psychology. Rooted in the theory highlights the historical and developmental ideas as well as the active and constructive role of humans (Kuutti, 1996).

In their study, Er and Kay (2005, p3) adopted the definition by Kuutti, which stated that AT is “a philosophical and cross-disciplinary framework for studying different forms of human practices as developed processes, with both individual and social levels interlinked at the same time.” Psychologists Engeström, Miettinen, and Punamäki (1999, p19) defined AT as a “cultural-historical theory of activity”. This is in line with the first-generation structure of the theory originating from Vygotsky. Vygotsky's based AT on the notion that human reasoning is as a result of a practical activity performed within a social environment (Hasan and Kazlauskas, 2014). According to Barab (2015) the main components of the AT, as defined by Vygotsky include the Subject (human agent) and Object (world) which are mediated by using the Tool(s) and signs. This generation of the AT is based on the need to understand the role of mental activity in establishing the relationship between the subject and the object (Kuutti, 1995).

Leont'ev expanded the AT giving rise to the second generation, by introducing the concept of an Activity. Leont'ev suggested that the activity is a specific form of human societal existence, and that the activity is object and tool mediated (Karanasios, Allen, and Finnegan, 2018).

In the second generation of AT the activity was recognised as the unit of analysis where, the Subject in the activity refers to the individual's motive, and the Object of an activity involves the purpose of the activity performed. The Object is achieved by the Subject performing an activity and this is mediated by the Tool which serves to empower the subject. Nardi, (1996), concludes that while the tool enables the subject, it also limits them in that they are restricted to the capabilities of the specific tool.

According to Barab et al., (2002) AT is not solely focused on subjects performing and activity, but more the idea of performing and action in order to transform it into something. Brouwer-Janse and Harrington (1994) indicate that the philosophy of AT combines an objective; an ecological; and a socio-cultural perspective. The essence of the theory is the ability for the researcher to analyse humans in their natural environment as they perform activities Brouwer-Janse, and Harrington (1994). This is best depicted in the third generation as expanded by Engeström.

Engeström et al. (1999) indicate that AT has, over the years, become multidisciplinary. It encompasses socio-cultural, socio-historical (Jonassen, and Rohrer-Murphy, 1999) and socio-technical (Mursu, Luukkonen, Toivanen, and Korpela, 2007) lens with the main objective being to facilitate the study of human behaviour or the human practice based on an activity. Engeström extended the theory structure to include rules, community, and division of labour as these components mediated the activity performed by the individual to achieve an object and is motivated into an outcome as described in Table 1.

Table 1: Activity Theory Components and Descriptions

Component	Description
Subject	A member of a working group that performs an activity (Kaenampornpan and O'Neill 2004).
Object	The target of the subject's action or the immediate goal of the activity (Kaenampornpan and O'Neill, 2004).
Outcome	The outcome refers to the resulting impact of the achievement of the object. (Kaenampornpan and O'Neill, 2004).
Tool	The artefact (tools) used to mediate the activity performed and these are defined in three categories (Ditsa and Davis, 2000): 1. <i>Primary tools</i> – these are tangible tools such as artefacts and instruments 2. <i>Secondary tools</i> – such as language and signs. 3. <i>Tertiary tools</i> – such as cultural systems Both the secondary and tertiary tools are referred to as psychological tools.
Rules	The regulations and norms stipulated to guide the subject regarding the activity performed (Hashim and Jones, 2007).
Community	The people who share the same problem space as the subjects in that they are also invested in the object orientated nature of the subject's Activity System (Gretschel, Ramugondo, and Galvaan, 2015).
Division of Labour	Division of Labour (DOL) refers to division of tasks within the community. More specifically, the division between the roles that perform an activity and those that influence the result of the activity performed (Kuutti, 1995).

According to Jonassen and Rohrer-Murphy (1999), AT is best suited for understanding the activity in a specific context; it is therefore, most appropriate when the unit of analysis is the activity itself, in their study they refer to this as an Activity System (AS). The AS highlights components (as defined on Table 1) that contribute to the realisation of the object.

Essential to AT are the contradictions, sometimes referred to as tensions (Murphy and Rodriguez-Manzanares, 2008), that exist between these different components. These contradictions manifest as either disruptions to or opportunities for change in achieving the object (Sujan, Rizzo and Pasquini, 2002). Foot, (2014) discussed the different types of contradictions as being either primary, secondary, tertiary or quaternary. A **primary** contradiction refers to the tension that exists within an individual component. For example, a tool can be exposed to a virus which results in its inability to function for the purpose it was designed. A **secondary** contradiction refers to tension that exists between two components of the Activity System, such as a tension that could exist between the Subject and the Community. A **tertiary contradiction** refers to tensions between two components as a result of something new being introduced to the activity system.

An example of this is a contradiction that may exist between the Subject and the Rules – a new rule introduced could result difficulties or hinder the subject’s ability to perform an activity. Finally, a **quaternary** contradiction refers to tensions that exist between two or more Activity Systems. As this study focused on one activity system the quaternary contradiction will not be discussed any further. Illustrated in Figure 3 is the basic Activity System (Engeström, 1987):

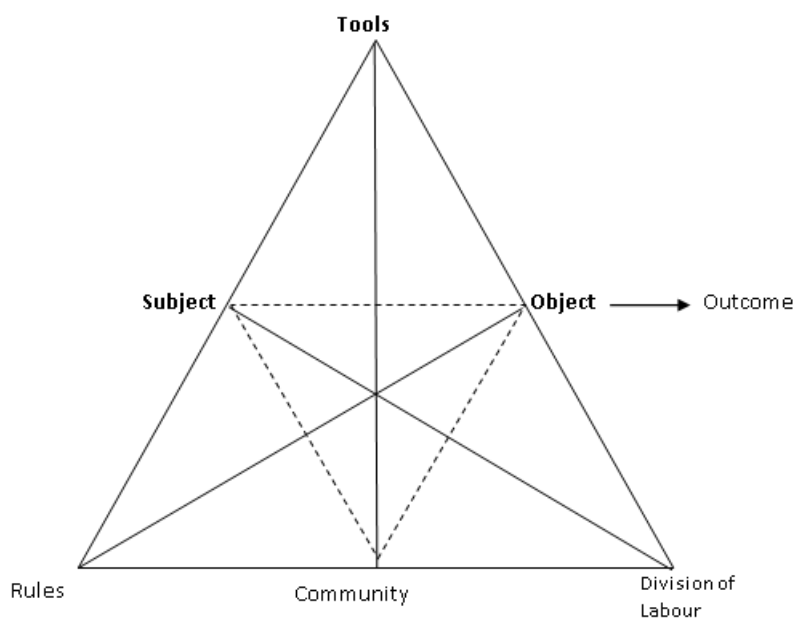


Figure 3: Activity System (Basic structure of an activity)

Ditsa and Davis (2000) further discussed how this theory was extended to include the outcome and that the subject performs an activity to achieve an objective. The existence of the activity is motivated when the object is transformed into the outcome (Nardi, 1996). The outcome is explored to identify the possible effects or impacts of using the tool to perform the activity, whether intended or unintended (Hasan and Kazlauskas, 2014). Additional components that impact the performance of the activity include the rules, the community and the division of labour.

Ditsa and Davis (2000), advise that the Subject, Tools and Object do not influence the outcome in isolation of the social and cultural practices existing in the specific context. AT allows the researcher the opportunity to understand the influence that rules, the community and the division of labour have on the object because of the activity performed by the subject. The components of AT are dynamic, and they continue to interact thereby transforming the object with each interaction (Barab et al., 2002). To explore and understand the impact that BYOD has on the employees within the financial institution, this study adopted the third generation of AT as the lens in the analysis.

3.3.1 Activity Theory in IS

AT has been applied to IS research for more than 10 years more so in research fields such as Human-Computer Interaction (HCI); IS and Information Science (Mursu et al., 2007). Karanasios, et al., (2018) state that in the IS space AT brings the technology (tool) and the context together into the activity and allows the realisation of technology-based artefacts as tools for activities (Bødker, 1991). It is common in research to see the individuals or organisations as the unit of analysis, however AT provides a different conceptualisation whereby the focus is on the activity as well as the enhanced understanding into IS, as researchers are exposed to new perspectives (Karanasios, 2018). AT allows for the understanding the collective interaction between the individual/team using technology to perform an activity within a specific context (Amry, 2018).

In their study, Baguma, Bagarukayo, Namubiru, Brown and Mayisela, (2019) adopts AT to examine how WhatsApp Enabled Learning can potentially develop Higher Order Thinking Skills in students and their study found that the systematic and practical nature of AT does in fact demonstrate an increased potential. Forsgren and Byström (2018), conducted a study to explore how social media may positively or negatively impact coherence in work activities. From the study Forsgren and Byström found that the use of social media served different purposes different activity systems, where a positive impact in on system would result in a negative impact in another surfacing contradictions.

According to Karanasios, et al., (2018) the focus of IS research has been driven to “understanding technology-mediated change in organisational settings, contradictions arising from the introduction of IS as well as organisational learning and transformation of work”. Considering this AT is a fitting theory to be adopted within IS research.

3.3.2 Application of Activity Theory

No literature has been found where researchers used AT as a lens to study the adoption of BYOD by employees. However, studies have been conducted on the adoption of mobile devices using AT as the theoretical lens (Cochrane, Narayan, and Oldfield, 2014; Liaw, Hatala, and Huang, 2010; Toktarova, 2016; Koole, 2007).

This study explored the impact that BYOD has on employees within a financial institution in South Africa. To address this, the researcher looks into the activities that the employee is currently performing using BYOD as the tool. AT allows the researcher the opportunity to explore how the different components influence the impact of the tool on the subject. With the unit of analysis for this study being the activity that the employee performs with BYOD, AT is found to be the most appropriate lens to be adopted. In the context of this study, the employee performs an activity, mediated by the various components of the Activity System, to achieve an object. The achievement of the object of various tasks performed is then transformed into the outcomes. The outcomes experienced demonstrate the impact that the use of BYOD has on the employee.

Figure 4 provides the conceptual framework, adapted from AT and illustrates a preliminary version of the framework. This will evolve during the data collection process as the researcher will then gather more accurate details about the components as they are applied to this study.

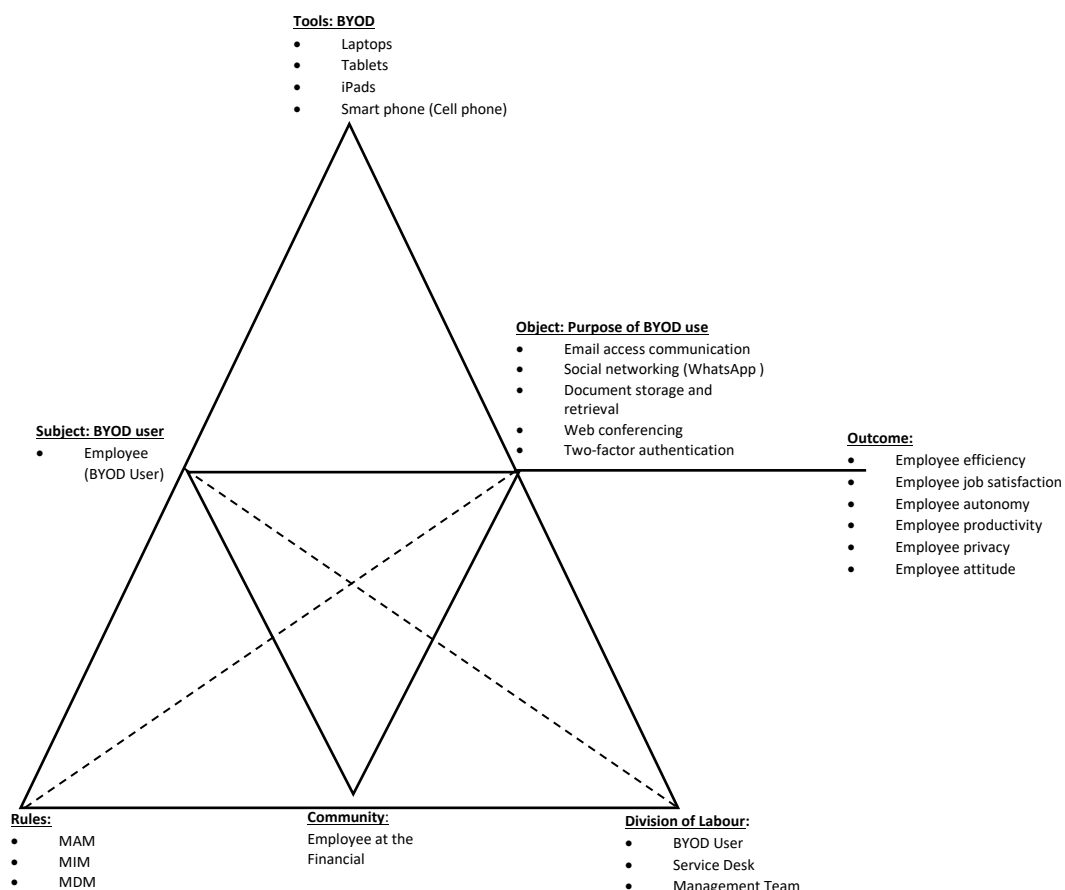


Figure 4: AT Conceptual Framework - Impact of BYOD on Employees

Studies that were found in the literature to have used AT focused on the individual as the Subject of study (Iyamu and Ngqame, 2017); Liaw et al., 2010; Barab et al., 2002). As the purpose of this study is to understand the impact on employees it is therefore fitting that the Subject refer to the Employee, as reflected in Figure 4.

As highlighted in section 2.2.3 employees have adopted BYOD for the following purposes: Email Access; Social networking (WhatsApp); Document storage and retrieval; Web conferencing, and Two-Factor Authentication. Based on the AT definition the Subject performs and activity to achieve the Object, as such the object in this study refers to the purpose for which the employees choose to use BYOD. While the purposes of BYOD use listed have been identified in the literature, the actual purposes were revealed during data collection. The researcher was then able to adjust the conceptual framework and the other interviews accordingly.

‘Outcome’ in AT refers to the resulting impact of the achievement of the object. For this study the outcome thus represented the impact on employees of achieving tasks using BYOD, and thus formed the means of answering the research question “What are the positive and negative impacts of BYOD for employees of the financial institution?” From the literature possible impacts were identified as being increased/decreased employee efficiency, increased/ decreased employee satisfaction, increased/decreased autonomy, increased/decreased employee productivity, increased/decreased employee privacy, and positive/negative employee attitude. These form part of the preliminary framework as shown in figure 4. The framework was later adjusted to reflect actual impacts that were identified during the data collection and analysis parts of the study.

To realise the impact on the employees, the activities performed are mediated by the Tools, Rules, Community and Division of Labour. Past research has regarded mobile devices as the tools to mediate the activity. Tools are artefacts mediating the relationship between the subject and the object (Uden, 2007). This study specifically referred to tools as personally owned mobile devices (**BYOD**). Literature revealed that laptops, tablets, smartphones (Gustav and Kabanda, 2016) or iPads (Aldhizer III and Bowles, 2011) were used as mobile devices for BYOD, so these were all regarded as tools, as shown in figure 4. This list was later updated to include the more accurate list of devices identified during data collection.

The use of BYOD is guided by Rules and Policies, these influence on the outcome. Literature highlights MDM, MAM and MIM (Eslahi et al., 2014) as guiding policies to manage the adoption of mobile devices, and some companies have implemented these policies for the adoption of BYOD.

In this study the community refers to other employees of the financial institution while the division of labour refers to the roles that different employees play in the achievement of a task using BYOD. For the purpose of this study the Roles have been identified to possibly include the BYOD User, the IT Staff, and the Management team who is responsible for approving the adoption and defining the rules and policies.

This completes the description of the preliminary version of the conceptual framework for this study. This section provided an understanding of AT as a conceptual framework attempting to unravel the impact of BYOD in relation to the research questions posed for this study. To understand the theory, the researcher touches on the history of AT and thereafter studies that have adopted the theory. The section further identifies components of AT based on the literature reviewed in this paper.

3.4 Summary

Three possible research lenses were discussed: Task Technology Fit (TTF), Technology Acceptance Model (TAM) and Activity Theory (AT), providing insight as to how these frameworks have been used in IS studies. Based on literature the most appropriate framework was identified to be Activity Theory. A preliminary conceptual framework based on AT was then developed for this study.

The next section will discuss the research methodology employed for this study.

4. RESEARCH METHODS

This section provides an overview of the research methods, highlighting the philosophical approach; research design and strategy; data collection and analysis. The section is then concluded with a discussion of the rigour of the study as well as the ethical considerations.

4.1 Philosophical Approach

There are two research paradigms available in the Information Systems field, namely: Positivist and Interpretivist. These paradigms are used with the aim of studying and understanding various aspects of society. Studies have been conducted to understand which paradigm is better, however; there have been findings indicating that because these paradigms are different, the most appropriate one can be chosen based on the social aspect being studied (Hasan, 2016).

The emphasis of the positivist paradigm is on the objectivity and reliability of the factors being studied and according to Weber (2004), the results are certain and replicable. According to Oates, (2006) the world exists independently of the human race and this world can be observed and measured by producing and testing hypothesis. Saunders et al. (2009) state that positivism is driven from the natural science point of view and is based on facts. Further to this, Oates (2006, p283) indicates that the paradigm is best suited to study aspects of the 'natural world' seeking to unravel the cause and effect between predefined constructs and throughout this process the researcher remains objective.

The aim of this study was to explore the impact of BYOD on employees within an organisation, the study was based on understanding the rules that guide BYOD in organisations, as well as the perceived positive and negative impact that the employees are exposed to because of it. To understand the impact of BYOD, the study looked into the uses of BYOD by employees within the organisation. Interview participants were invited to discuss and describe how they believe using BYOD has impacted them. Data collected would therefore not be objective, but rather would reflect participant perceptions. The nature of this study considered that the perceptions of employees are influenced by all resources accessible to them (Walliman, 2011). These resources could include the guiding rules, the surrounding community, interactions with other employees as well as the technology.

The interpretivist paradigm allows the researcher to observe a phenomenon which is not fully understood and perhaps to build a theory (Gill and Johnson, 2010, p7). It is most appropriate for studies that seek to derive an understanding of a phenomenon rather than a generalisation (Mukhopadhyay and Gupta, 2014; Walsham, 1995). As advised by Oates (2006), interpretivism is guided by the notion that the study participants behave, and the study is influenced by, their life experiences which essentially brings the idea that not all things are constant. Understanding that this study draws from human interpretations as expressed by the employees, and seeks to explore and gain an in-depth understanding of BYOD impact on employees, the interpretivist approach has been deemed as the most appropriate adopted as the preferred paradigm.

As discussed in previous sections there is little research regarding employees and the impact of BYOD. Since interpretivism allows for the exploration of hidden reasons behind social processes (Bhattacharjee, 2012, p105), it was found to be best suited for this current study.

4.2 Research Design

According to Bhattacharjee (2012, p35), a research design is a plan, sometimes referred to as the blueprint, for data collection with the aim of answering the research questions. It was important to ensure that the research design selected for the study would be beneficial to the research process. There are a few methods to choose from, however, the correct one would allow for valid observations and interpretation of the results (Bhattacharjee, 2012, p5).

Academics tend to lean towards one of three research designs: Descriptive, Explanatory and Exploratory. The descriptive design requires a more accurate and systematic method of researching facts (Sandelowski, 2000), while the explanatory design seeks to explain the relationship between factors as well as why these relationships exist (Baskerville and Pries-Heje, 2010). Both the descriptive and the explanatory research designs were not deemed appropriate for the current study.

As the BYOD phenomenon under study has not been widely researched in the context of a bank, it was determined that the exploratory research design was best to be adopted. Exploratory research is most appropriate when new areas of study need to be investigated as it enables researchers to identify the main elements of the phenomenon and what would be the influencing factors (Bhattacharjee, 2012, p5). The exploratory design was found to be best for the current study as it allowed for exploring the impact of BYOD use on employees in the context of this study.

4.3 Research Strategy

According to Bhattacharjee, (2012, p41), determining the appropriate strategy should be based on the research design identified for the study. Where the objective of the study is to test (positivist research) then the experimental, survey, or secondary data analysis strategies are appropriate. The case study, grounded theory or ethnography strategies are best suited for an exploratory study (interpretivist) research. Ethnography and grounded theory are time-consuming as they require close interactions with the participants (Saunders et al., 2009, p148-150).

The use case definition adopted from Robson by Saunders et al. (2009, p588), states that a case study is “a strategy for doing research which involves an empirical investigation of a particular contemporary phenomenon within its real-life context using multiple sources of evidence”. Yin (2003, p13) states that when adopting a case study as a research strategy it is important to ensure that the real-life context of the study is clearly defined. The context for this study was a financial institution that allows employees to use their own devices for work purposes. A random selection of employees that use BYOD were interviewed to explore the impact they experienced from BYOD use. The case study was the adopted strategy for the current study as it allowed for the collection of data from multiple sources in the financial institution by interacting with employees that perform activities using BYOD. The case study also assisted in understand the impact of BYOD use in the context of this study.

A case study can be either longitudinal or cross-sectional. According to Arora (2015), a longitudinal study requires the researcher to collect data from at least two different places in time and from the same sample group. This approach allows the researcher the opportunity to analyse how data changes over time as a result of the mediating factors.

Miller (2017) states that the cross-sectional study allows the researcher to study a participant once as well as to gather the data over a short period. The cross-sectional study also allows for the collecting of data from one institution. Time constraints were identified for the current study, there was no time to collect one set of data, as such the cross-sectional study design was adopted which allowed for one set of data collected.

4.4 Data Sampling

For this study the non-probability (purposive) sampling method was adopted as the most appropriate to facilitate the selection of the participants from the financial institution. Etikan, Musa and Alkassim (2016) discussed that while non-probability sampling techniques are subjective in nature, they are most appropriate for a study where research results are not established for generalising. This research was a case study based and with this it was noted that generalisability was not an objective (Zainal, 2007), therefore the use of non-probability sampling was applicable. The objective of this study was to explore the impact of BYOD on employees and as such looked to gather data from a variety of participants that have used BYOD in the financial institution. Interviewees were carefully selected with the objective of exploring the use, challenges and impact of BYOD as thoroughly as possible. For this reason, it is fitting that the purposive sampling method was adopted.

4.4.1 The Participants

As highlighted by Hsieh and Shannon (2005), identifying the sample individuals to participate in the study is a key aspect in research. Specific to this study the sample group was identified from a financial institution in South Africa in the Gauteng province. Since Activity Theory was adopted as the appropriate lens, the unit of analysis for this study is the activity that employees perform with BYOD in the context of the financial institution. Information about the BYOD activities specific to the employees at the organisation could only be obtained by interviewing the employees that perform them. Each employee could perform many activities with BYOD, so the interviews had to correspond with more than one unit of analysis. Since the activity performed by the employee was identified as the unit of analysis, the sample size was driven by the number of activities explored in this study, as identified from literature as discussed in Uses of BYOD in the Workplace.

The researcher conducted interviews with 8 participants for the collection of data, as per the proposed plan. These participants were selected by the researcher from a larger population of over 20 people spread across 3 teams within the organisation. In order to select the 8 participants, the researcher observed the members of the teams, as a result of this the researcher was able to select the 8 participants, identified to be knowledgeable regarding the use of BYOD, that were most likely to optimise the research value of the sample.

Based on the number of interview questions and consideration of potential additional information to be provided by participants, each interview was estimated to take approximately 60 minutes. While the interviews were scheduled for a maximum of 60 minutes, the total time spent in each interview varied from 45 to 60 minutes.

4.4.2 The Organisation

The selection of the financial institution within this research was partially motivated by the fact that it is one of the five big banks in South Africa (businesstech, 2019) and has also been reported as a leading organisation in terms of electronic channel capabilities (fin24, 2015). In addition to the above points of motivation, the researcher had a connection with the organisation from a customer and employee perspective. For these reasons, the researcher identified greater value in selecting this organisation with the anticipation of an increased opportunity to contribute to practice based on the research findings.

4.5 Data Collection

In an interpretive study, the most common data collection methods include Interviews, Observation, and Documentation (Bhattacharjee, 2012, p106). **Interviews** are based on predefined questions or themes to guide the interviewer through the interview process. Interviews allow the interviewer the opportunity to probe further based on the participant's response. **Observations** can either be *Participant or Non-Participant* observations. According to Cassell and Symon (2004) participant observation refers to the situation where the researcher chooses to be part of the population community, socially interacting with the study participants; where non-participant observation refers to the researcher observing the participant's behaviour from a distance; **Documentation** refers to the researcher using annual reports, emails, statements and website as the source of data for the study.

While the methods mentioned above are common to interpretive studies, Patton (1990), states that focus groups and questionnaires are sometimes used. **Questionnaires** contain either open or closed questions and are left to the participants to write their own responses; **Focus Groups** are structured or semi-structured interviews with small groups and these interviews allow for the participants to interact with one another (Klenke, 2016, p132). Further to this, Klenke (2016), elaborates that focus groups are not very reliable and lack validity since participants can influence each other in how they respond.

To collect the data, the researcher opted to conduct interviews with the selected participants. According to Saunders et al., (2009), interviews can be identified in three categories. The first category is 'structured interviews' which are based on a predetermined set of questions; another category is the 'unstructured interviews'; these are open-ended and seek to probe without imposing on the interviewee, while allowing the participants to fully express their views (Punch, 2005). The final category is 'semi-structured interviews' (also known as non-standardised interviews); these interviews combine predefined and open-ended questions, this approach allows for the exploration of new issues that might arise from the interviews (Wilson, 2014).

For this study, semi-structured interviews were used as they allow for a conversational approach to interviews where the participants are not restricted to set questions only, but are also able to explore issues that they feel are important (Longhurst, 2003). With the purpose of this study being to explore the impact of using BYOD on employees it was important for the research to ensure that the participants were awarded the opportunity to express themselves as much as possible.

B1: Interview Protocol was created based on the literature found on this topic, discussed in chapter 2, and was compiled in a manner that addressed the research questions. The objective of the interview protocol was to attain a more in-depth understanding of how the participants use and are impacted by the use of BYOD. The interview questions are a combination of open-ended and closed questions derived as a result of the literature and conceptual framework discussed in chapters. During data collection, the list of questions presented to the participants were extended based on previous participant responses. The interview protocol was extended due to participants having mentioned the impact of using BYOD additional to what was identified through literature. Participants spoke to experiencing increased levels of anxiety as a result of BYOD use as well as the importance of considering device compatibility.

Prior to data collection the researcher applied for ethics clearance, as per details discussed in Ethics section of this report, to ensure that the data collection process is guided by research principles. While the data collection was planned to be completed between August and September 2019, the interviews only commenced in September and ended in October due to availability of the participants chosen to participate in the study. The researcher was able to successfully complete the data collection within the time stipulated on the ethics clearance certificate.

4.5.1 Interviews

The data collection for this study was facilitated using semi-structured face-to-face interviews as the collection method. The interviews (guided by an B1: Interview Protocol) provided the researcher the opportunity for further probing, which proved to be beneficial to the study.

The interviews were conducted privately in a meeting room at the organisation's premises, and the tools used to collect the data included audio recordings as well as documents mentioned by the participants. At the beginning of each interview the researcher re-iterated the purpose of the study as well as providing an overview regarding the measures taken to ensure that any content shared by the participant would remain confidential and their identity kept anonymous. The request to record the interviews was posed with the participants in the interview and they were reassured that the audio recordings were stored securely in a password protected device on which only the researcher has access.

All participants signed consent forms and thus confirmed that they were comfortable proceeding with the interview and having it recorded. The questions, as detailed on the interview protocol were presented to the eight participants, who in turn volunteered the information as best they could.

4.5.2 Data Triangulation

The use of different data sources for data collection is referred to as data triangulation (Jentoft and Olsen, 2019). Triangulation implies that a single point is investigated from different and independent sources (Decrop, 1999). Wilson (2014) states that the use of data triangulation enables the collection of richer and fuller data. In addition to the data collected from the participants during the interviews, some of the participants directed the researcher to relevant documentation that existed within the organisation. These documents, shown in Table 5 on page 47, were then also used in this research and their content has been discussed in the findings section. The additional data sources were reviewed in order to verify the interview content as well as to provide more clarity on some of the questions raised during the interviews.

4.6 Data Analysis

According to Kelley, Clark, Brown and Sitzia (2003), the purpose of data analysis is to summarise the data collected such that it is easy to understand and comprehensively answers the research question. Oates (2005, p267) states that qualitative research analysis is more systematic; unlike quantitative research which is guided by statistical processes. A researcher can interpret the data, draw conclusions and make relevant recommendations. They are also able to relate the findings to the literature to assess the research design. It is important for researchers to ensure that when analysing the data, they understand and address their potential to be subjective to the findings. To achieve this one needs to “understand the differences between humans in our role as social actors” (Saunders et al., 2009, p129).

There are different analysis methods available to researcher, these include content; framework; narrative, and discourse analysis. These are however, best suited for a study which has been well investigated in a range of areas and disciplines. In this study the focus of the data analysis was to explore how the participants have responded to the questions; to identify the impact of BYOD on employees, thus the thematic analysis and coding (a process that allows the researcher to reveal themes embossed in the data (Williams, and Moser, 2019)) method was chosen as the preferred method of analysis. Thematic analysis can be achieved through a deductive and inductive coding process. The deductive coding process involves analysis done in line with the research questions and literature gathered in the study to ensure that the analysis remains relevant. While the inductive analysis involves analysing, processing and interrogating of the data collected.

In this study, the researcher identified themes from literature as such deductive coding process was used. At the end of the, multiple, coding session new codes were identified from the data collected. This meant that the researcher used both the deductive and inductive coding processes to successfully engage in the data analysis for this study.

Braun and Clarke (2006), highlighted steps of thematic analysis which assist in ensuring a structured and concise approach to analysing the data collected as discussed below. These steps allowed the researcher the opportunity to sort the data and ensure completeness and accuracy. The researcher then documented the findings according to the data collected and analysed.

Step 1: Be familiar with the data collected

The researcher conducted the interviews and personally transcribed the interview recordings into a Microsoft Word document. This allowed the researcher the opportunity to immerse themselves into the data, with this understanding of the data the researcher is able to provide a more in-depth analysis of it. The data was transcribed, and these transcripts were vetted against the audio recordings to ensure accuracy of content.

Step 2: Identifying codes

Coding of the interview transcripts was done after the interviews and completed within the time allocated for data analysis. No software tool was used for coding instead codes were then identified from this transcribed data. The researcher immersed themselves in the data and conducted a line by line review of each response to identify patterns. The patterns were based on the themes identified from the research questions as well as literature. When all identified patterns from known themes were coded, the researcher was able to surface the new themes applicable to the study.

Step 3: Finding themes

Focusing on all the available transcripts the researcher was able to collate relevant data extracts from the eight interview responses. The researcher looked for data that was consistent and distinctive and these were then used to formulate the research themes. The coded data is grouped into potential themes. The researcher began data analysis with 13 themes of which one theme was identified from the research questions, 12 were identified from literature. These were the themes from which the interview protocol was based. During the coding process 2 new themes were identified from the data collected.

Step 4: Reviewing themes

The researcher spent time reviewing the themes to ensure that they are in line with the coded data. It was also important to ensure that time was spent reviewing the themes in conjunction with the interview transcripts. This was done to ensure that the themes identified were clear and that the collated data extracts did in fact belong to the relevant themes.

Step 5: Defining and naming the themes

It is important to ensure that the themes are defined accurately according to their fundamental meaning. With a clear definition of the theme it is then possible to provide a relevant name for the theme. Table 2 provides the list of themes identified in this study along with a brief description thereof.

Table 2: Data Coding

Activity Theory Component	Conceptual Description	Study Description
Subject	A member of a working group that performs an activity (Kaenampornpan and O'Neill 2004).	The individual who uses BYOD to perform work-related tasks.
Object	The target of the subject's action or the immediate goal of the activity (Kaenampornpan and O'Neill, 2004).	The tasks that the employee performs using BYOD. Email Access (Yeboah-Boateng and Boaten, 2016); Communication- WhatsApp (Veljkovic, 2018); Document storage and retrieval (Mahatanankoon, 2015); we-conferencing (Kerravala and Michels, 2015) and Two-Factor Authentication ¹ (Weidman and Grossklags, 2017).
Outcome	The outcome refers to the resulting impact of the achievement of the object. (Kaenampornpan and O'Neill, 2004).	Perceived outcomes based on literature included Employee: Efficiency, Job satisfaction Autonomy, Productivity, Privacy, and Attitude (section 2.3)
Tool	The artefact (tools) used to mediate the activity performed and these are defined in three categories (Ditsa and Davis, 2000): <i>Primary tools</i> – these are tangible tools such as artefacts and instruments <i>Secondary tools</i> – such as language and signs. <i>Tertiary tools</i> – such as cultural systems Both the secondary and tertiary tools are referred to as psychological tools.	BYOD as the artefact used to perform work-related tasks but not restricted to a specific device.
Rules	The regulations and norms stipulated to guide the subject regarding the activity performed (Hashim and Jones, 2007).	Perceived BYOD related rules, based on literature included: Mobile Device Management (Smith, 2017); Mobile

¹ While two-factor authentication in the context of security policies is a security control measure, in this study it is understood in the context of being a task that the employees perform as part of their daily work.

Activity Theory Component	Conceptual Description	Study Description
		Application Management (Tewari et al., 2015); Mobile Information Management (Downer and Bhattacharya, 2015)
Community	The people who share the same problem space as the subjects in that they are also invested in the object-orientated nature of the subject's Activity System (Gretschel et al., 2015).	Employees of the financial institution
Division of Labour	Division of Labour (DOL) refers to the division of tasks within the community. More specifically, the division between the roles that perform an activity and those that influence the result of the activity performed (Kuutti, 1995).	Roles that different employees play in the achievement of a task using BYOD. Based on the researcher's knowledge of the organisation and personal experience, these roles were perceived to include: BYOD Users; IT Staff; Management Team

Once the themes were defined and named, they were categorised according to the research questions that they best addressed and sorted in line with Activity Theory according to activity system components. The theme "Use of BYOD" was identified as best suited to address research question 1, "What do employees of the financial institution use BYOD for?" The data defined in this theme was interpreted according to Activity Theory. The theme was sorted according to the components of the activity systems.

Research question 2, "What are the positive and negative impacts of BYOD for employees of the financial institution?" was categorised according to the impacts of BYOD use for work facilitation as well as the personal impact of BYOD use for employees. Themes relevant to impact on work facilitation included: 'Flexibility and Mobility', 'User Experience', 'Convenience', 'Employee Interaction', 'Productivity', 'Organisational Support', and 'Device Compatibility'. The themes were sorted according to this category and aligned to the relevant activity system components, which included: Subject, Tool, Community, and Division of Labour.

The themes relevant to impact on the employee included: 'Flexibility and Mobility', 'Efficiency' 'Autonomy', 'Job Satisfaction', 'Cost Implications', 'Work-Life balance/overlap', 'Anxiety,' and 'Privacy and Security'. Relevant activity system components included: Subject, Outcome, Rules.

The below table illustrates themes identified from literature and the research questions defined in this study.

Table 3: Initial Research Themes

Nr	Theme	Description	Source
1	Use of BYOD	The purpose for which and the frequency at which employees use their various personal mobile devices for the work-related activities.	RQ1
2	Flexibility and mobility	Employees' views on flexibility and mobility as a result of BYOD.	Literature example: Gens et al., (2011);
3	User experience	How employees view user experience when using BYOD as compared to using organisation issued devices	Literature example: Waterfill and Dilworth, (2014)
4	Convenience	The way in which the use of BYOD influences the convenience and quicker turnaround times experienced by the employees.	Literature example: Waterfill and Dilworth, (2014)
5	Employee Interaction	How the use of BYOD influences employee interaction	Literature example: Adedolapo & Kabanda, (2016)
6	Productivity	The levels to which BYOD impacts productivity on work-related tasks	Literature example: Lebek et al., (2013)
7	Organisational support	Employee's choice of devices and the support provided by the organisation to facilitate the successful use of the devices for BYOD.	Literature example: (Adedolapo and Kabanda, 2016)
8	Efficiency	The way in which the use of BYOD influences the quicker turnaround times experienced by the employees and how it influences efficiency.	Literature example: Waterfill and Dilworth, (2014)
9	Autonomy	The levels to which employees experience freedom, independence and self-sufficiency as a result of using BYOD	Literature example: Olalere et al., (2016)
10	Job satisfaction	How the use of BYOD can result in increased/decreased employee job satisfaction	Literature example: French et al., (2014)
11	Cost Implications	The cost implications of BYOD experienced by the employees	Literature example: Weeger and Gewald, (2014)
12	Work-Life balance/overlap	The extent to which the employees' balance their time between work and private life.	Literature example: Schalow, et al., (2013)
13	Privacy and Security	The employee's perception regarding their data privacy as well as their views on the security measures in place when using BYOD for work-related activities.	Literature example: Bélanger and Crossler, (2011)

4.7 Rigour

As emphasised by Lacey and Luff (2009), rigour is an important issue in research, and qualitative research is no exception to this view. According to Bhattacharjee (2012, p105), for interpretive studies, rigour refers to the systematic and transparent approach to data collection and data analysis. Research aligns rigour with the validity and reliability of results obtained from the data. In the context of qualitative research, reliability refers to the ability to reproduce the methods used in the research as well as how these methods are consistent. Validity refers to how the data collected is plausible, credible and trustworthy (Bashir, Afzal, and Azeem, 2008).

To demonstrate the rigour in the data and results found in this study the researcher ensured self-correcting measures (Morse, Barrett, Mayan, Olson and Spiers, 2002). For self-correcting, the researcher continuously revisits the design and implementation (Morse et al., 2002). This back and forth was done throughout the research process. The strategies have been drawn from the study by Krefting (1991), who indicated that if applied correctly the researcher can confirm the quality of rigour.

The nature of a qualitative study is that it allows the researcher to refine the research process to achieve reliable and valid data ensuring rigour. The purposive sampling method adopted for this study encourages the richness of data in that the individuals partaking in the study have the necessary knowledge to contribute to the study. During the data collection and analysis stages of the study, the researcher invested care and patience when transcribing the audio recordings; this was done to ensure that the data is transcribed in its truth with no misinterpretation. To achieve this, it was important for the researcher to remain objective during the process.

4.8 Ethical Considerations

Information systems research is identified as a social science study (Recker, 2012, p143). With qualitative research, the norm is such that the study is based on human interaction through the process of interviews, focus groups and observations. This strengthens the importance of ethics during the research. Saunders et al. (2009, p184) expressed that ethical behaviour is important and should be a key component when prepping for or conducting a study. Miller, Birch, Mauthner and Jessop (2012, p18) support the statement by Saunders et al. (2009) and continue to advise that decisions concerning ethics in research need to be considered throughout the research process, from the conceptualisation and design stage right to the write-up and findings.

For this study, the researcher has upheld moral principles throughout the research process. Before commencing with the data collection, the researcher applied for ethics clearance, on 01 July 2019, and the signed clearance certificate (CBUSE/1477) was granted on 22 July 2019. The ethics clearance for the collection of data was due to expire on 31 October 2019; this was sufficient time for the researcher to complete the data collection process. The guidelines on how to handle one's self, engage with the participants and how to handle the data were clearly defined in the ethics documents completed for ethical clearance submission. The researcher ensured that the study observed and aligned with the research ethics stipulated by the University of Witwatersrand ethics committee along with the standards of the Information Systems department.

To ensure that ethical considerations are adhered to, the researcher took the necessary steps to ensure that the financial institution, on which the study was based, was informed in advance and that the gatekeepers (who for this research study was a division manager guided by the human resource representative) granted permission for the study to be conducted (Consent form for organisation). Employees were then invited to participate and prior to data collection, the participants were fully informed regarding the purpose of the study and advised on the voluntary nature of the study with the option to withdraw from the interview at any time.

During the data collection and analysis stages, the researcher took care to ensure objectivity. Privacy and confidentiality were key considerations when handling and storing the data collected. The personal details and information provided by the participants was stored in a password-protected computer and these details were not disclosed to anyone.

False names have been used in the findings section to ensure that the identity of the participants remains anonymous. The anonymity and confidentiality was extended to the bank on which the study was based.

After data collection, every attempt was made to interpret the raw data with the utmost honesty and to take ethical issues into account. The researcher strived to ensure that data is not manipulated or misinterpreted. The researcher also tried to ensure that the questions included in the questionnaire do not cause participants any mental or physical harm.

4.9 Summary

As highlighted in this section, the interpretivist paradigm was adopted to explore the impact of BYOD on employees within the financial institution. The guiding research strategy was a case study, where the researcher used the cross-sectional study design to collect data through face to face interviews at a single point in time, scheduled over a period of two months. The purposive sampling method was used to identify the population, who were then invited to participate. These participants were identified to being knowledgeable and had experience using BYOD. Once the data was collected, it was analysed using the thematic analysis and coding method. Every attempt was made to ensure that results of the study are plausible, credible and trustworthy. The researcher also ensured that all ethical principles and guidelines were applied throughout the data collection and analysis phases of the research.

5. FINDINGS

The purpose of this study was to explore the impact of BYOD on employees within a bank in South Africa, Gauteng province. In an attempt to address the gap in knowledge the data was collected in line with the following research sub-questions:

1. What do employees of the financial institution use BYOD for?
2. What are the positive and negative impacts of BYOD for employees of the financial institution?

Literature relating to this study was reviewed and documented as detailed in chapter 2. From the discussions in existing literature Activity Theory was adopted as the appropriate framework for this study. Based on the interviews conducted, this chapter provides a summary of the findings based on the feedback from participants. The following sections aim to highlight how they were selected as well as their demographic information. The chapter then goes into the detail of the data collected in relation to the defined themes based on the codes identified. The chapter is concluded with an overview of the content discussed.

5.1 Summary of Participants

Participants that were interviewed were selected using the purposive sampling method; which gave the researcher the ability to rely in their own judgement in selecting the employees that met the criteria of this study. The researcher observed three teams within the organisation and based on the observation was able to identify those individuals that would potentially add the most value to the research. These participants were identified to be using BYOD and because they have different roles in the organisation, they use BYOD for different activities.

Table 4 shows a summary of the participant's demographics. Aliases have been used in order to protect the identity of the participants and therefore ensuring confidentiality in the research report. The aliases were derived based on each participant's job title, and where participants shared the same job titles, numbers were used to differentiate them. In addition to the names of the participants, the table depicts the job title per participant. While it was not initially intended, the employees that the researcher was given access to were all within a technology department, and as such the findings in this research report are documented from the perspective of IT employees.

The findings revealed that majority of the participants are fairly new to using BYOD, with less than 4 years. Participants with more than 15 years at the bank (from here on referred to as Bank A for security reasons). have been using BYOD for longer. One participant, although new to the bank, indicated that they have extensive experience with using their personal devices for work-related activities,

“The last 8 years...so I mean in the 7 months that I have been with Bank A, I have been able to access my emails from my cell phone at any point any time anywhere and then obviously in my previous role the same thing” (SA).

Niehaves, Koeffer, Ortbach, and Stefan (2012) indicated that BYOD has been trending for 16 years ago, since 2004. Surprisingly some participants mentioned that they have been using their personal devices for work-related activities for 16 years or more,

“18 years...since I started. I started just as cell phones became a thing, so people were calling for support and that kind of thing” (TTL);

“in Bank A it was always the case” (ITA).

Table 4: Participants by job title, years of employed at the bank and years using BYOD

Participant Pseudonym	Job Title	Years employed at the bank	Years using BYOD
TTL	Technical Team Lead	18 years	18 years
JD	Java Developer	3 years	1 year
SA	System Analyst	7 months	8 years
ADM1	Application Development Manager	5 years	3 ½ years
ITA	Head of Information Technology Architecture	16 years	16 years
ADM	Application Development Manager	13 years	2 years
BA	Business Analyst	4 years	1 year
TATL	Test Analyst Team Lead	3 years	2 years

5.2 Summary of Supporting Documents

During the interviews participants alluded to the existence of policy documents published by the bank for them. Many of the participants were unable to speak to the content of these documents (summarised in Table 5), but the documents themselves were collected and analysed for the purpose of this research report.

Table 5: Documents Collected

Document Type	Document Description	Document Source
Software installation guide	Installation guide provided to employees for the access to company data from private devices (BYOD).	Identified as a result of interview discussions
Security policy	New Cyber Crime and Security legislation circulated to the employees stipulating guidelines to protect the organisation (and employees).	Identified as a result of interview discussions
Mobile device policy	Policies guiding the use of mobile devices within the organisation for personal and work-related activities.	Identified as a result of interview discussions

5.3 Interview Analysis

This section details the key findings obtained from the interviews conducted. A total of 15 themes were identified as depicted on Table 8 on page 55. The first theme, *Use of BYOD* provides insights from the participants concerning the purpose for which and the frequency with which they use their personal mobile devices for work-related activities within the organisation. The theme also highlights the devices that are used by the participants for BYOD and is directly linked to research question 1: “What do employees of the financial institution use BYOD for?”

Two themes (*Device Compatibility* and *Anxiety*) emerged from the interviews and balance of the themes (*Flexibility and mobility*, *User experience*, *Convenience*, *Employee interaction*, *Productivity*, *Organisational support*, *Efficiency*, *Autonomy*, *Job satisfaction*, *Cost implications*, *Work-life balance/overlap*, *Privacy and security*) were discussed in the literature review as positive and negative impacts of BYOD (Olalere et al., 2016). These themes have been used to address research question 2: “What are the positive and negative impacts of BYOD for employees of the financial institution?”

As mentioned in the conceptual framework section 3.3.2, Activity Theory has been adopted as the lens for this study. As such the themes mentioned on Table 8 on page 55 have been aligned with Activity Theory in the context of the financial institution, thus improving the understanding of the activity system in relation to BYOD use.

As suggested by Jonassen and Rohrer-Murphy (1999), an activity system is used to explore an activity in a specific context; it comprises of components that are integrated in order to achieve the desired activity objective. Figure 5 below illustrates the preliminary activity system as adapted to the context of this study before data collection. Refinement of this activity system is done in the findings chapter to align to the themes identified once the data had been collected.

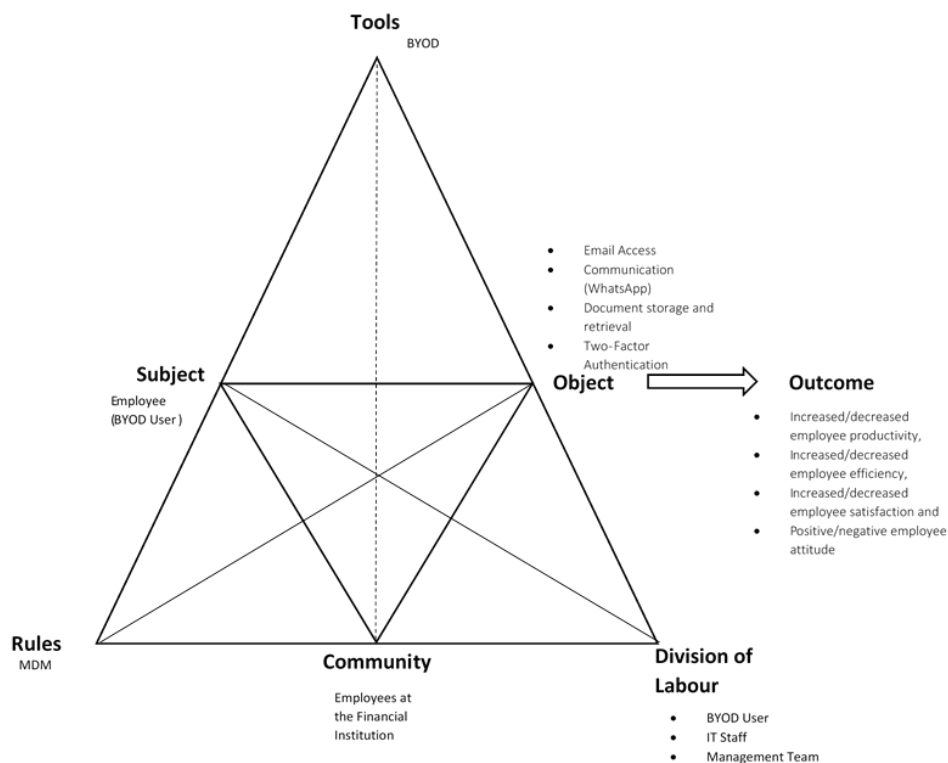


Figure 5: Conceptual Activity System (Based on literature)

The following sections will document the findings in relation to the research questions defined in this study.

5.3.1 RQ1 - What do employees of the financial institution use BYOD for?

5.3.1.1 Use of BYOD

The *Use of BYOD* theme provides the required information to address this research question. The theme itself draws from the participant responses in relation to the type of devices used, the frequency with which they use BYOD and the purpose for which employees use BYOD.

5.3.1.2 Devices Used

Illustrated in

Table 6 is the list of BYOD devices used by employees within the organisation as well as the total number of participants using the devices. As per the findings documented in

Table 6 the most common device used by participants is the cell phone as all eight participants indicated they were using their cell phones for work-related activities,

“my cell phone” (ADM2, BA)

“I use my cell phone” (TATL)

Table 6: Personal devices used for BYOD

Personal Mobile Device	Participants
Cell phone (smartphone)	8
Tablet	2
Watch (smart watch)	1
WIFI Network	3
Laptop	0

Other devices used by the participants included, smart watches, personal WIFI networks and tablets,

“phone, my watch and my network router” (ADM1);

“I also use my own Wi Fi router” (JD)

“cell phone and tablet” (SA, TTL).

Participants mentioned that the devices commonly used for BYOD by other employees within the organisation included the cell phone, personal laptops and tablets/iPads,

“mostly cell phones, some laptops” (JD);

“Cell phone and tablet” (TTL);

“Majority of employees use their cell phones for BYOD. There are other employees that use tables and laptops” (ITA).

In relation to the Activity System the Tools used by the participants are depicted by the types of devices used for BYOD. As indicated in Figure 6, BYOD users in the organisation use different personally owned devices when performing work-related activities.

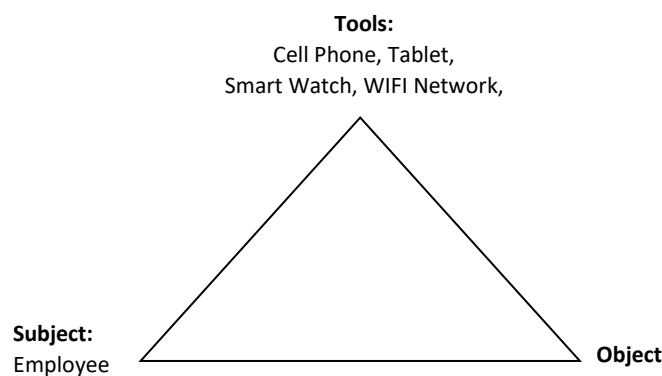


Figure 6: Activity System for Use of BYOD_Tools

In previous studies personal devices used for BYOD have been identified as laptops, tablets, smartphones (Gustav and Kabanda, 2016) or iPads (Aldhizer III and Bowles, 2011). In response to the question ‘Describe any devices issued to you by the organisation that are used for your work’ all eight participants indicated that they were assigned laptops,

“normally you would get a laptop, a screen, a desktop screen if you're lucky” (ADM1);

“I have a laptop that's it.” (BA)

5.3.1.2 Frequency of BYOD use

When asked how often they use BYOD for work activities, many of the participants could not quantify the time in hours but expressed that they use BYOD throughout the day,

“Throughout the day” (TTL);

“I am always with my phone” (JD);

“the whole day, even on weekends” (ITA),

“5 min before the meetings end, I possibly would be checking... somebody texts me to go and read an email then I do that on the phone” (BA).

5.3.1.3 Purpose of BYOD Use

Table 7 provides a view of the purpose for which BYOD is being used, the number of participants using BYOD for that purpose, and the job titles of employees using BYOD for that purpose. A source indicating where the activity was first identified is also shown.

Table 7: Purposes for which BYOD is being used per number of participants and by job title

Purpose of BYOD Use	Number of Participants	Job Title	Source
Email communication	8	Application Development Managers; Technical Team Lead; Head of Information Technology Architecture; Developer; Test Analyst team lead; Business Analyst and System Analyst	Literature: Yeboah-Boateng and Boaten, (2016)
WhatsApp communication	5	Developer; Head of Information Technology Architecture; Application Development Manager; Technical Team Lead; Test Analyst team lead	Literature: Veljkovic, (2018)
Microsoft Teams communication	2	Developer; Technical Team Lead	Interview
Drawings	1	Technical Team Lead	Interview
Note taking	2	Application Development Manager; Technical Team Lead	Interview
Calendar planning / management	4	Application Development Manager; Test Analyst team lead; Business Analyst and System Analyst	Interview
Management Responsibilities	3	Application Development Managers; Test Analyst team lead	Interview
Project Testing	1	Test Analyst team lead	Interview

Purpose of BYOD Use	Number of Participants	Job Title	Source
Two-Factor Authentication	1	Technical Team Lead	Literature: Ni et al., (2016)
Document storage, retrieval and sharing	0	--	Literature: Mahatanankoon, (2015)
Web Conferencing	0	--	Literature: Kerravala and Michels, (2015)

The purposes of BYOD use in the workplace as identified in previous studies (see section 0): Email Access; Social Networking (WhatsApp Messenger); Document storage, retrieval and sharing; Web Conferencing; and Two-Factor Authentication. The interviews indicated that the participants do use BYOD for most of these previously identified purposes, and also revealed more purposes of BYOD use.

Participants mentioned that they use BYOD, mostly, for accessing their emails and the majority confirmed that they also use BYOD for immediate communication

“for work emails. I use it to check my calendar. I also have test apps, test systems on my device to test bank work” (TATL);

“I mostly use my phone for communication that’s emails, Microsoft Teams, WhatsApp” (JD);

“communication emails, WhatsApp, MS Teams” (TTL),

Other purposes mentioned included tracking calendars, two-factor authentication, management tasks, system tests, free hand drawings as well as taking notes during meetings

“accessing and responding to emails monitoring and managing my calendar” (SA);

“two-factor authentication may be required before access is granted...I use my tablet for free had drawings and note taking during meetings” (TTL);

“leave and claim approvals” (ADM1);

“test systems on my device the test bank work”;

One participant indicated that BYOD is also used, specifically in the testing space, to perform system tests,

“test systems on my device the test bank work” (TATL).

In terms of the Activity System, the purpose for which BYOD is used can be seen as the object of the activity performed by the subject. Figure 7 represent the object in Activity Theory framework, this facilitates the understanding of how the “Subject” (employee) performs an activity mediated by a “Tool” (BYOD device) in order to achieve the “Object” (purpose of BYOD use). The Activity System, the purpose for which BYOD is used can be seen as the object of the activity performed by the subject.

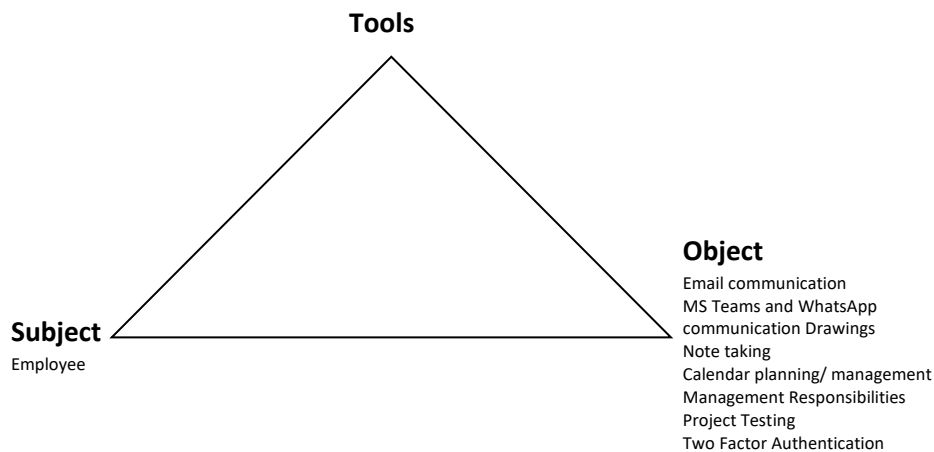


Figure 7: Activity System for Purpose of BYOD Use_Object

While the participants have a range of devices to use for the desired activities, the interviews revealed that the devices are used for specific activities. For the purpose of communication and two-factor authentications, employees are more inclined to use their cell phones, while they opt to use their tablet devices for the purpose of free hand drawings and note taking.

These findings support literature as previous studies have documented the purposes of BYOD use as email access (Yeboah-Boateng and Boaten, 2016); instant messaging (Veljkovic, 2018); and two-factor authentications (Weidman and Grossklags, 2017). Previous studies also identified *Document storage and retrieval* and *Web Conferencing* as purposes for which employees use BYOD, however the findings of this study revealed that none of the participants use BYOD for these work activities. *Document storage and retrieval* and *Web Conferencing* have therefore been excluded from further discussions.

5.3.1.4 Summary

Considering the number of devices that could be used for BYOD, the data collected revealed that the cell phone is the main device used for BYOD by the participants. This is evident as cell phone use was clearly mentioned by all eight participants. Other purposes for which employees use BYOD in the organisation have been summarised in Table 7 above. The researcher also noted that the use of BYOD in terms of frequency cannot be quantified, however based on the participants' responses it can be concluded that the use of BYOD is fairly frequent throughout the day.

5.3.2 RQ2 - What are the positive and negative impacts of BYOD for employees of the financial institution?

A total of 15 themes have been defined from the data collected for this research report. Table 8 expands from the themes mentioned on Table 3 in section 4.6 to include themes that have been identified from the research findings as described below. One of the 15 themes was identified based on RQ1; 12 themes were identified from the literature section 2, and 2 themes identified from the interviews.

Table 8: Revised Research Themes

Nr	Theme	Description	Source
1	Use of BYOD	The purpose for which and the frequency at which employees use their various personal mobile devices for the work-related activities.	RQ1
2	Flexibility and mobility	Employees' views on flexibility and mobility as a result of BYOD.	Literature example: Gens et al., (2011);
3	User experience	How employees view user experience when using BYOD as compared to using organisation issued devices	Literature example: Waterfill and Dilworth, (2014)
4	Convenience	The way in which the use of BYOD influences the convenience and quicker turnaround times experienced by the employees.	Literature example: Waterfill and Dilworth, (2014)
5	Employee Interaction	How the use of BYOD influences employee interaction	Literature example: Adedolapo & Kabanda, (2016)
6	Productivity	The levels to which BYOD impacts productivity on work-related tasks	Literature example: Lebek et al., (2013)
7	Organisational support	Employee's choice of devices and the support provided by the organisation to facilitate the successful use of the devices for BYOD.	Literature example: (Adedolapo and Kabanda, 2016)
8	Efficiency	The way in which the use of BYOD influences the quicker turnaround times experienced by the employees and how it influences efficiency.	Literature example: Waterfill and Dilworth, (2014)
9	Autonomy	The levels to which employees experience freedom, independence and self-sufficiency as a result of using BYOD	Literature example: Olalere et al., (2016)
10	Job satisfaction	How the use of BYOD can result in increased/decreased employee job satisfaction	Literature example: French et al., (2014)
11	Cost Implications	The cost implications of BYOD experienced by the employees	Literature example: Weeger and Gewald, (2014)

Nr	Theme	Description	Source
12	Work-Life balance/overlap	The extent to which the employees' balance their time between work and private life.	Literature example: Schalow, et al., (2013)
13	Privacy and Security	The employee's perception regarding their data privacy as well as their views on the security measures in place when using BYOD for work-related activities.	Literature example: Bélanger and Crossler, (2011)
14	Device Compatibility	The relationship between the choice of technology by the employee and the efficiency of the technology chosen when performing work-related tasks.	Interview
15	Anxiety	The extent to which employees feel increased levels of anxiety as a result of using BYOD	Interview

The first theme, *Uses of BYOD*, detailed the findings that address the first research question. This section discusses 15 themes, as listed in Table 9 the themes are grouped into the relevant categories. Note that the table also indicates the Activity Theory component that each theme relates to. In Table 9 themes were categorised into two groups: those that highlight findings in relation to how BYOD has influenced work facilitation and those that indicate how BYOD use has impacted the users on a personal level. The table also indicates the Activity Theory component that each theme relates to.

Table 9: Themes per category

Category	Theme	AS Component
Work Facilitation	Flexibility and Mobility	Subject
	User Experience	Subject Tool
	Convenience	Subject
	Productivity	Subject
	Employee Interaction	Community
	Organisational Support	Division of Labour
	Device Compatibility	Tool
Personal Impact	Flexibility and Mobility	Subject
	Efficiency	Subject Outcome
	Autonomy	Subject Outcome
	Job Satisfaction	Subject Outcome
	Cost Implications	Subject Outcome
	Anxiety	Subject Outcome
	Work-Life balance/overlap	Subject Outcome
	Privacy and Security	Subject Rules

5.3.2.1 Impacts of BYOD for employees of the financial institution on work facilitation

This section focuses on those themes concerning the benefits and disadvantages experienced by the participants. To gain this understanding the following themes have been examined; *Flexibility and mobility, User Experience, Convenience, Employee interaction, Productivity, Organisational support, and Device Compatibility*.

Flexibility and mobility

Based on the interview responses, the researcher found that participants find flexibility and mobility to be a positive impact of using BYOD. Flexibility and mobility has been found to be an impact of BYOD use for employees from two perspectives. Firstly, as an impact on work facilitation and secondly, as an impact on the employees themselves. As such flexibility and mobility will be discussed in both sections of the findings.

The participants indicated that their flexibility and mobility has increased as a result of using BYOD. They have seen the increased productivity while working from the office as well as from working outside organisation's premises. Participants mentioned that before BYOD, to keep up to date - specifically with their calendars - they needed to print their calendars or carry their laptops with them at all time. The increased flexibility and mobility resulting from BYOD allows employees the opportunity to continuously have site of their day plans on their smaller devices like the cell phone which seems to be easier to carry. In addition to being able to view one's calendar, BYOD has also been found to enable working on actual tasks from anywhere and at any time,

"Flexibility comes well from the fact that I can be anywhere, and I can still communicate with the rest of the team... flexibility to work from home, flexibility to work from any location ...You can cater to both personal and work needs at the same time without one or the other suffering...you can strike a balance by using your own device." (JD)

"the cell phone is always in my pocket" (BA)... Personally, I memorized two/ three meetings after that I had that to come back to my desk. So, it's made my life easier and that says that I don't necessarily need to be memorizing... I don't need to print paper to have on my physical because that's what I used to do for my day planner... I have the flexibility of knowing where to go next. " (BA);

"what I can say is that I don't have to carry the laptop with me all the time" (TATL).

Participants also mentioned to have experienced flexibility in terms of the device choices available to the employees within the organisation was also a benefit of using BYOD.

“you have the flexibility to choose the correct equipment for the job is was instead of a generic piece of equipment that you have to adapt to make work” (TTL)

Increased flexibility and mobility and the added advantages of not needing to carry heavy items around, and being able to work remotely were seen to positively facilitate the work of the employee within the organisation (i.e. it positively impacts the activity performed by the “Subject” to achieve the “Object”), and therefore could be seen as positive impact of BYOD use.

This is represented as an outcome in Activity Theory framework illustrated in figure 8. This benefit also facilitates our understanding of how a “Tool” (BYOD device) improves the activity performed by the “Subject” (employee) to achieve the “Object” (list shown in Figure 7). The part of the Activity System it is thus relevant to is shown in figure 8.

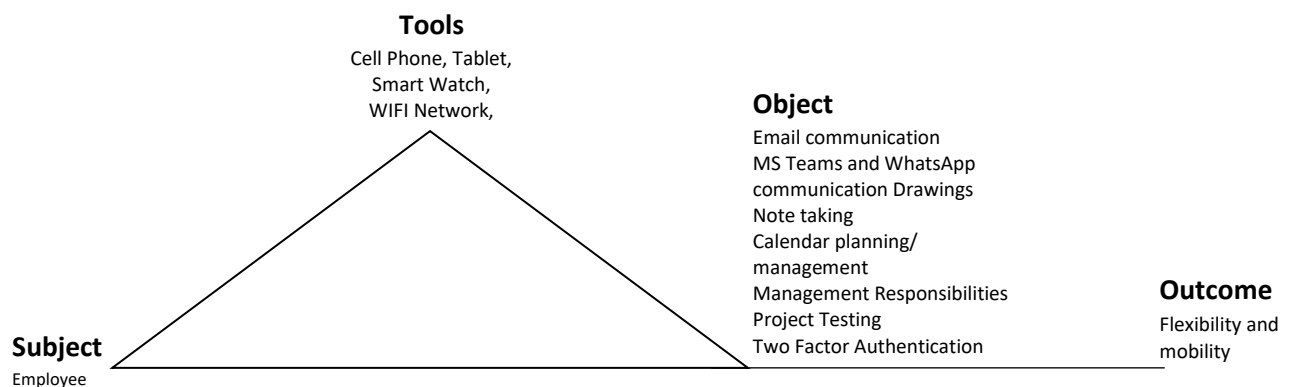


Figure 8: Activity System for Flexibility and Mobility(Affecting the Subject, Tools and Object)

Similar to the findings by Gens et al., (2011); Garba et al., (2015), BYOD has been found here to allow the employee flexibility and mobility in performing work-related activities. The participants have expressed that they find value in using BYOD as it results increased flexibility and mobility. Based on both the literature reviewed for this research report as well as the findings from the interviews conducted, flexibility and mobility are positive impacts of using BYOD.

User experience

Since BYOD is driven by the employees and not the organisations (Doargajudhur and Dell, 2018), the choice of which device to use for BYOD lies with the employee. Improved levels of comfort and competency when using your own devices were highlighted by the participants and resulted in the 'user experience' theme being identified.

The interviews revealed that, because of BYOD and the ability to choose the device, the employees found they had a better user experience,

"You don't need to adjust or have to settle with what you've been given by an organisation you are comfortable with your device" (JD);

"I believe that this does affect my use of BYOD...UX is definitely better than using a company issued device, purely because it is accessible, it's much smaller than the company issued device" (ADM1).

"the user experience is much better, because it's something that I want... for me there is, much more value or higher user experience when you use your own device" (ITA).

In addition to the choice of which device to use, the participants indicated that they experience ease of device use which in turn allows for better user experience,

"I think BYOD adds a better user experience...the level of competency you have with the device because it's, it's what's familiar to you" (SA).

The ability to choose the device they like and their familiarity with the chosen devices would positively facilitate the work of the employee within the organisation (i.e. it positively impacts the activity performed by the "Subject" to achieve the "Object"), and therefore could be seen as positive impact of BYOD use. This is represented as an outcome in Activity Theory framework illustrated in figure 9. Once again, this benefit facilitates our understanding of how a "Tool" (BYOD device) improves the activity performed by the "Subject" (employee) to achieve the "Object". The part of the Activity System it is thus relevant to is shown in figure 9.

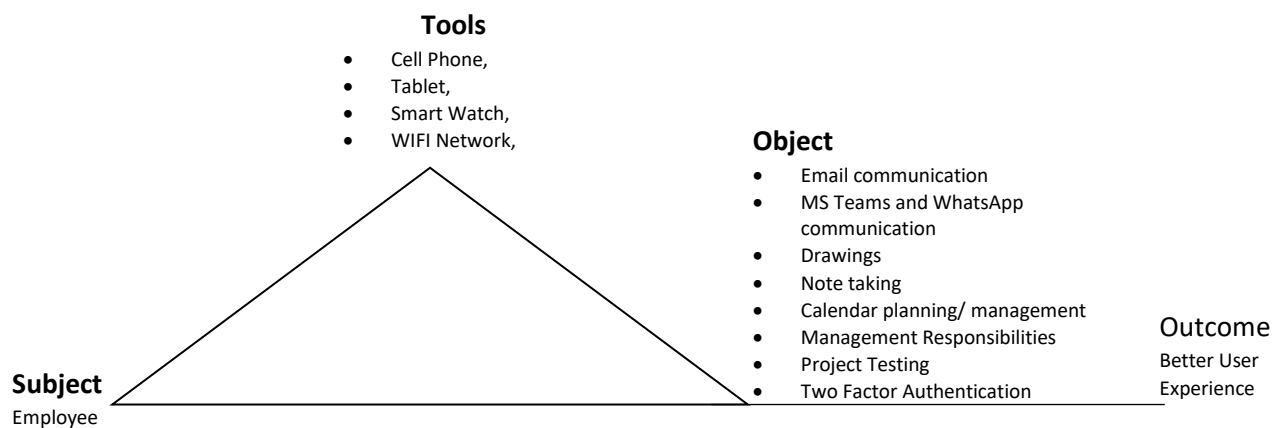


Figure 9: Activity System for User Experience (Affecting the Subject, Tools and Object)

These findings are supported in the literature. According to Magruder et al., (2015) levels of user experience resulting from BYOD are related to the levels of employee productivity. French et al., (2014) suggested that as a result of familiarity and comfort it can be expected that employees will find better levels of user experience.

Convenience

This section focuses on convenience as a benefit of using BYOD. Based on the feedback from the participants, it was found that the participants experience increased convenience from using BYOD. Some participants have mentioned that BYOD use allows for an easier way of life, for others the use of BYOD allows for greater comfort and convenience. It is therefore suggested by the participants using their own devices, results in better convenience when performing work-related activities,

“Having your own device allows for comfort, convenience” (SA),

“My device is much more convenient” (ADM1);

“personally, using my cell phone actually made my life easier” (ADM2).

“So, the familiarity allows for some kind of performance gained there... you do not have to switch devices and you are then able to be efficient in all aspects of your life by providing results within reasonable time” (TTL).

The increased convenience and the benefit of comfort and familiarity in respect to the BYOD device were seen as a positive impact of BYOD use. Figure 100 illustrates increased convenience as an outcome in Activity Theory framework. This allows for an understanding of how the “Tool” (BYOD device) betters the activity performed by the “Subject” (employee) to achieve the Object (purpose of BYOD use). How the subject is personally impacted by the use of BYOD in the workplace is depicted as the Outcome in of the Activity System. The components of the Activity Systems relevant to this relationship are shown in figure 10.

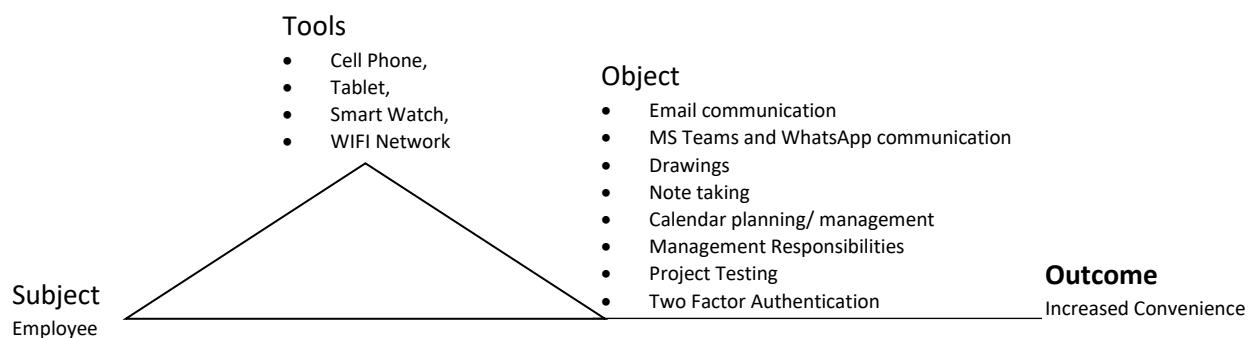


Figure 10: Activity System for Convenience (Impact)

In their study Kabanda and Brown (2014), found that BYOD use is a value add and it results in increased convenience. The findings of this current study are support the findings by Kabanda and Brown.

Employee interaction

When asked about how BYOD influences the participant’s interactions with other employees in the organisation the responses received indicated that the participants realised better communication and better information sharing between the team. The participants expressed that the interaction among employees was enriched by the use of BYOD in relation to better communication,

“BYOD does not hinder but better the interaction with colleagues ” (JD);

“it definitely improves communication” (TTL);

“you are able to connect with the person that you need to almost immediately” (SA).

“It certainly betters the interaction because of the timeous nature of BYOD” (ITA);

BYOD also allows for quicker responses, resulting in better information sharing,

"I can easily respond to or give direction to somebody" (JD);

"ability to keep up to date with what's happening in the team" (ADM1);

"Yes. I feel like I'm quicker, more focused and I'm able to assist some other people on the team. so, getting the information quicker because you always have the device all right centre" (ADM2).

As per the findings of this study employee interaction has improved as a result of BYOD use, it could be seen to positively facilitate work activities within the organisation (i.e. it positively impacts the activity performed by the "Subject" to achieve the "Object"), and therefore could be seen as positive impact of BYOD use. Employee interaction is represented as the community in Activity Theory framework, as shown in figure 11. This assists in understanding of how the "Community" (other employees interacting with BYOD) mediates how activity performed by the Subject (employee) results in the "Object" (purpose for BYOD use) being achieved. These impacts have been identified as better communication and information sharing as illustrated in Figure 11.

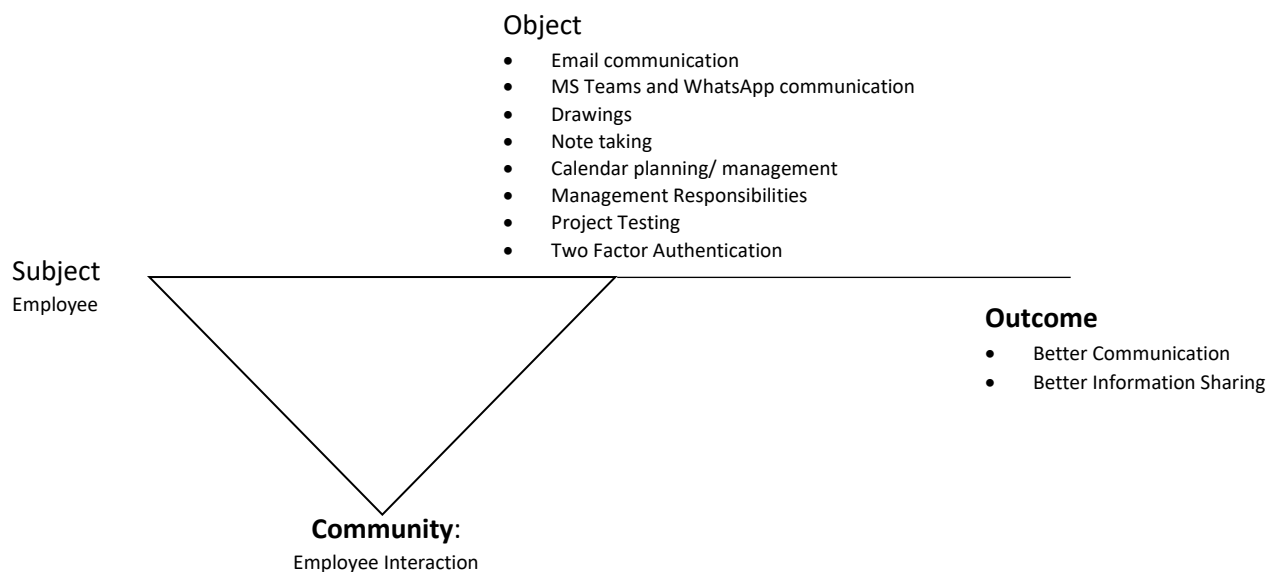


Figure 11: Activity System for Employee Interaction (Affecting Community)

Better communication and better information sharing as a result of using BYOD would facilitate employee productivity in the organisation and can therefore be seen as a positive impact in this regard and is illustrated in figure 11.

It was suggested that the use of personally owned devices such as smartphones for work-related activities allows for a team the opportunity to simplify communication (Ostermann, 2018), to communicate urgent messages, bounce off ideas or set up meetings without delays (Veljkovic, (2018); (Peretti and Sarkisian, (2014)) , this is supported by the findings of this research report. Participants have expressed the realisation of better communication and better information sharing as a result of using BYOD.

Productivity

This theme highlights the levels to which productivity on work-related tasks is impacted by the use of BYOD. To understand how BYOD influenced employee productivity it was necessary to explore the influence of not having one's device in the workplace. The interviews highlighted that participants were, to a level, dependant on their own devices in order to be productive, as they expressed that they would be negatively impacted if they could not use BYOD for the purpose of performing work-related activities. It was alluded that the personal devices were key in ensuring that the employees are able to perform their day to day work activities,

"My device is my primary source of communication during the day for both personal and work-related tasks...I would need to go back home" (BA)

"It's like flying blind... I don't know what I don't know and that can be a bad thing, especially if things go wrong. If I'm the last one to find out obviously I'd be in trouble. In my role the team members need to get hold of me at all time" (ADM1)

"It impacts me tremendously from a personal capacity to even a work capacity... My battery died and I missed the meeting and it was this whole confusion because I left my phone at my desk on charge...and as a result of missing the other meeting. I then had to give a statement as to why. My battery died, and I missed the meeting and it was this whole confusion because I left my phone at my desk on charge...and as a result of missing the other meeting. I then had to give a statement as to why". (TATL)

The participants indicated that as a result of using BYOD they have experienced better productivity. They also attributed the increase in productivity to the various benefits associated with the use of BYOD, as they made mention of user experience,

“working with a device that you own, you have configured, you are comfortable with, you can easily navigate through different files, locations, even applications that you use, because it's all things that you set up yourself. So that speeds up your work rate that speeds up delivery due to the ease of use” (JD)

“I think it does result in increased productivity...you're able to work on whatever pieces of tasks or deliverables that you have, you're able to add to it and meet deadlines a little bit easier... You have quick access to information so I would say that it's beneficial.” (SA)

Participants also mentioned how using personal devices was better than using devices issued by the organisation,

“Productivity is slightly hindered with our work devices because we can only do so much on it. My productivity would be increased because it makes this device dynamic to an extent that I don't necessarily need to be switching...allow for a more calmer setup in terms of your environment” (BA)

The use of BYOD in the workplace was found to result in increased productivity from two points of view. Firstly, the participants indicated that the use of BYOD allows them to be more productive in achieving the purposes for which they use BYOD. Secondly, the use of BYOD increases productivity as a benefit for the organisation. This was based on the notion that when the employees are able to be productive in performing their work activities then the organisation benefits,

“from my perspective, yes, is a much higher productivity benefit for the organisation” (ITA);

“But it definitely helps organisations make more money or meet deadlines and stuff, so it facilitates your delivery in terms of meeting deadlines” (TATL)

The comfort and the quick access experienced when using personal devices has been seen to result in increased productivity and this positively facilitates the work of the employee within the organisation (i.e. it positively impacts the activity performed by the “Subject” to achieve the “Object”), and therefore could be seen as positive impact of BYOD use. This is represented as an outcome in Activity Theory framework illustrated in figure 12. Once again, this benefit facilitates our understanding of how a “Tool” (BYOD device) improves the activity performed by the “Subject” (employee) to achieve the “Object”. The part of the Activity System it is thus relevant to is shown in figure 12.

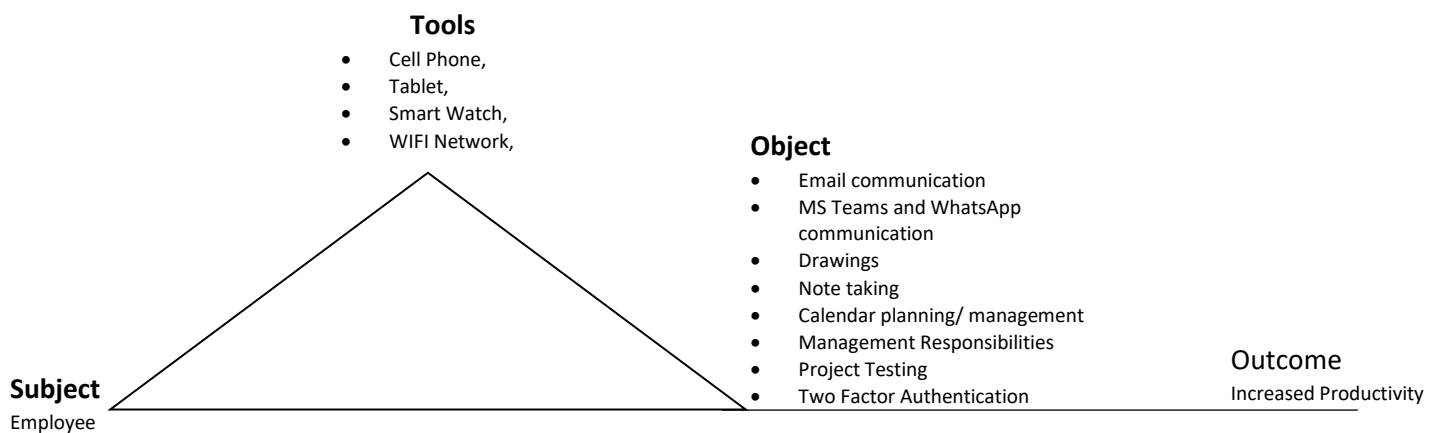


Figure 12: Activity System for Productivity (Affecting the Subject)

The findings from the interviews support the view expressed in previous literature. Increased productivity was also identified by Waterfill and Dilworth (2014) as a benefit to employees performing work-related activities using BYOD. Lebek et al., (2013), suggested that BYOD as a phenomenon motivates an increase in productivity for both the employee and the organisation.

Organisational support

The support from the organisation was found to be two-fold, firstly the researcher explored the support provided when setting up for BYOD. This involved the end to end process to understand who was available to provide the required assistance to the employees as well as identifying the extent of the support. Secondly, the researcher looked into support from the perspective of what assistance is available to the employees when using BYOD.

Support for BYOD setup

To adequately understand the organisational support in relation to the process of setting up for BYOD during, the researcher explored what the organisation deemed as requirements for setting up as well as who in the organisation was involved in assisting BYOD users with the setting up process.

Setting up process

The participants indicated that when setting up for BYOD they were expected to install organisation defined software applications without which they would not be able to use BYOD for the intended purposes,

“there's software that is required in order to set up things like email, Skype or MS teams” (JD);

“added applications that needed to be installed” (SA);

“The software will figure out that your time to load your work email onto your personal device, it will prompt you to download all the security sandbox in software” (ITA).

BYOD users are able to setup using the guidelines provided by the organisation. Participants indicated that these guidelines are shared with them, by the organisations, by means of email or a link to a page in the organisation's portal,

“generally, the organisation sends out guiding emails with steps to follow for setting up your device for BYOD” (ADM1);

“the onboarding communication that I received when I joined the organisation” (SA);

“a customer portal which you have to log into the organisation there's certain restrictions and rules that are set in terms of what you can do with the applications that belong to the organisation on your device” (JD);

The existence of the abovementioned guidelines is also confirmed by the fact that they are detailed in one of the documents collected as evidence for this research – shown as “Software Installation Guide” in table 5.

While guidelines were provided by the organisation, when asked if they knew what guidelines are stipulated by the organisation to assist you in setting up, some participants mentioned that they were not particularly aware of these guidelines,

“not particularly, No” (TATL);

“It's not really visible to an extent that you even if you are just walking around” (BA).

In order to understand who was involved in the setting up for BYOD, the participants were asked to provide their experience with the people with whom they had to interact during this process. The participants mentioned that the setup process was primarily the responsibility of the employee wanting to use BYOD.

They also indicated that the process itself is straight forward and that the guidelines provided were quite clear,

“Setting all of that up is usually up to you...There's links to support team to contact them with any issues that you do have in setting up your” (JD);

“steps to follow were really clear and concise” (SA).

It was mentioned in the interviews that the process to setup for BYOD was clear and seamless. When asked to highlight challenges regarding the process of setting up, the participants re-iterated the seamless nature of the process and indicated no challenges it,

“everything has been seamless” (BA)

“it is such a seamless process, I have never experienced challenges with the setup process” (ADM1);

“Setting up has no challenge” (ITA);

“no challenges experienced” (ADM2).

The interviews revealed that the simplicity and speed when setting up for BYOD is influenced by the purpose for which employees use BYOD. Based on the findings the shortest time to setup was identified to be 10min to where the longest time was 35min,

“For me it was a 10-minute exercise to install, setup and configure” (JD);

“When I had to set up my emails it took about 10 minutes, so the process does not take long at all” (ADM1);

it is quite length it took me 35 minutes to set it up” (TATL).

The researcher was advised that the service desk was an IT support team that attended to employee inquiries relating to technical challenges.

“I don't have to rely on someone from the support department at the organisation...if something were to go wrong so you can probably phone Help Desk” (ADM1);

“The help desk team is available to assist” (ADM2);

“during work hours there is a support team available” (ITA)

Where guidelines or the service desk are not accessible to the employee, it was mentioned that colleagues who were already using BYOD had been able to assist,

“My colleague was able to assist me with the setup” (ADM2);

“The person who assisted me was a work colleague that got it done on his device” (TATL).

Challenges with setup

The setting up process might be clearly defined but some participants have highlighted external factors that hinder the setup process. As the organisation has prescribed applications for BYOD, they also supply employees with WIFI, however the strength of the WIFI is not sufficient for the full download of these prescribed applications.

“app that is required in order for you to access your emails on your phone, the Wi Fi restrictions within this organisation doesn't allow you to install apps from your Play Store” (SA);

System issues were also highlighted as potential challenges, in that the expected system actions were not fulfilled and as a result the setup process would be terminated. The employee would then need to redo the process, in this regard progress in day to day activities could be impacted,

“issues where the 2FA would not come through to the device so what you were trying to setup would then timeout” (TTL)

Support for using BYOD

While guidance and support is provided by the organisation when setting up for BYOD, it appears that there is no support available for issues or challenges that could arise while the employee is using BYOD. The interview findings also highlighted that participants were of the opinion that the support structure specifically for employees using BYOD was inadequate,

“There is no support provided, it's pretty much a case of they provide the baseline and that's all” (TTL);

“As far as I recall the support provided relates to the installation of the organisation recommended software applications” (ITA);

“The lack of support does actually hinder progress” (TTL);

“There is assistance but it's not like instant or immediate. You can look ticket like a task for somebody to look at but that's not like a quick resolution to the programmatic space” (JD).

“BYOD is encouraged, there is no support” (TATL).

Based on the findings there are people available to assist employees with the setting up of BYOD. As the use of BYOD is left as a choice for the employee there is no approval required from management for setup.

The participants have mentioned there is a support team available to assist when setting up for BYOD, which could be recognised to positively facilitate the work of the employee within the organisation (i.e. it positively impacts the activity performed by the “Subject” to achieve the “Object”), and therefore could be seen as positive impact of BYOD use.

However, it was also highlighted that the employees experience a lack of assistance in relation to challenges experienced when using BYOD, this lack of organisational support could be seen to negatively affect the facilitation the work of the employee within the organisation (i.e. it negatively impacts the activity performed by the “Subject” to achieve the “Object”), and therefore could be seen as negative impact of BYOD use.

It is fitting that organisational support as a theme be mapped to the Division of Labour component in Activity Theory framework, shown in figure 13. The findings on organisational support facilitates our understanding of how a “Division of Labour” (support from BYOD User and Service Desk) improves the activity of setting up for BYOD, by the “Subject” (employee), so that they are able to perform work activities to achieve the “Object”.

The findings also allow for the understanding as to how the lack of “Division of Labour” (support from BYOD User and Service Desk) could negatively mediate how the “Subject” (employee) performs activities to achieve the “Object”. The part of the Activity System it is thus relevant to is shown in figure 13.

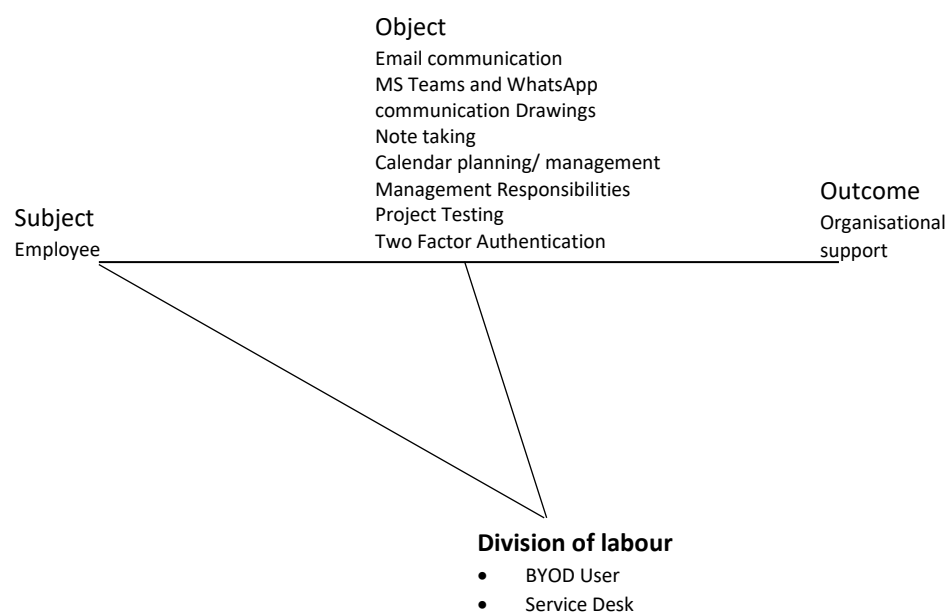


Figure 13: Activity System for Organisational Support (Affecting the Division of Labour)

The findings in this study support Adedolapo and Kabanda, (2016), who suggested that the institutional support influences the subject's decision to adopt BYOD use. Ostermann and Wiewiorra (2016), highlighted that the availability of support for BYOD use is important for both the employee and the organisation. With support from the organisation employee frustrations could be managed and for the organisations the necessary guidance could be provided ensuring proper channels and access to organisational information.

Device Compatibility

The interviews revealed that employees needed to have certain applications installed Appendix D: Turnitin Report, in order to fulfil their work tasks. With the evolving technology newer and more advanced technologies are being released into market. While the use of BYOD is the employee's choice, the organisation does restrict the employees in what applications they can use for work-related activities. The applications, recommended by the organisation, are not specific to the device's operating system and are not restricted by the type and size of the device. Considering that the choice device for BYOD use in the workplace is that of the employee, as such the participants indicated that the devices are sometimes not compatible for the applications recommended by the organisation or the size of the device impacts on the visual display impacting on usability.

Participants alluded to device compatibility challenges with a focus on the applications that one can upload onto their devices,

"Specific software only works properly on a laptop but not on a cell phone so those are challenges you can get" (JD);

"applications that I use for work, but I am unable to access them via my device, so I think this is a disadvantage because it would enhance my experience even more giving me greater convenience" (SA).

"There are restrictions in the applications that you can use for work-related tasks" (ITA).

It was also mentioned that the BYOD devices are sometime incompatible with respect to the visual, due to the size of the screen,

"when you are reading a document on your cell phone is not as easy as it is on a laptop that's just annoying... having to scroll from one end to the other... it's not as easy on a mobile device it is on a laptop" (JD);

The interviews revealed that, when looking into device compatibility, it is important to consider the purpose for which the employee is using BYOD. For example, any smart device can easily facilitate instant messaging, however free hand drawings and note taking would be easier and clearer on a tablet as opposed to a cell phone with a smaller screen.

Device compatibility has been raised as a concern by the interview participants as it could be seen as a disadvantage to BYOD use, in that incompatible devices could result in negative facilitation of work activities by employees (i.e. it negatively impacts the activity performed by the “Subject” to achieve the “Object”), and therefore could be seen as negative impact of BYOD use. The device incompatibility is shown as tools in Activity Theory framework. This brings focus to the understanding that how the Subject (employee) performs the activity is influenced by the “Tool” (BYOD device) used to achieve “Object” (purpose of BYOD use). The part of the Activity System, relevant to this theme is illustrated in figure 14.

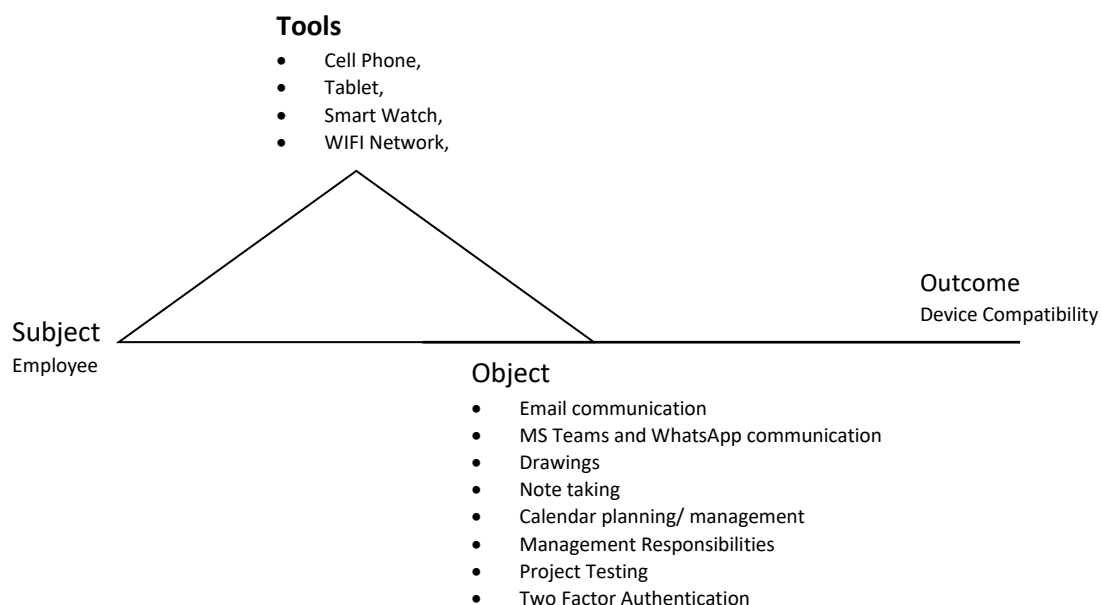


Figure 14: Activity System for Device Compatibility (Affecting Tools)

Device compatibility was highlighted by the study participants as a challenge that was specific to them within the organisation, no previous studies were found in relation to device compatibility for BYOD use in the context of this study. Niehaves et al., (2012) found when using mobile devices compatibility of the device could be a concern. As BYOD is based on employees using their personal mobile devices the findings in this study are in line with the findings by Niehaves et al., (2012).

5.3.2.2 Personal impact of BYOD for employees of the financial institution

This section continues with the themes in relation to the benefits and disadvantages experienced by the participants when using BYOD for work-related activities, with the focus now being on how these participants have been impacted as a result of BYOD. To gain this understanding the following themes have been examined; *Flexibility and mobility, Efficiency, Autonomy, Job Satisfaction, Cost Implications, Work-Life balance/overlap, Anxiety, and Privacy and Security.*

Flexibility and mobility

Flexibility and mobility has documented as being an impact of BYOD use for employees on work facilitation. The focus of this section is on flexibility and mobility as an impact on the employees themselves. Participants mentioned that flexibility and mobility in terms of the technology / device choices available to them within the organisation was also a benefit of using BYOD.

“you have the flexibility to choose the correct equipment for the job instead of a generic piece of equipment that you have to adapt to make work” (TTL)

“it comes to the choice of your own device and then you will choose something that you like” (ITA)

Increased flexibility and mobility and the added advantages of having freedom of device selection were seen positive impact of BYOD use. Figure 10Figure 15 illustrates increased flexibility and mobility as an outcome in Activity Theory framework. This allows for an understanding of how the “Subject” (employee) performs the activities, mitigated by the “Tool” (BYOD device), to achieve the “Object” (purpose of BYOD use). The “Outcome”, shown in the Activity System, indicates how the subject is personally impacted by BYOD use in the workplace. The components of the Activity Systems relevant to this relationship are shown in figure 15.

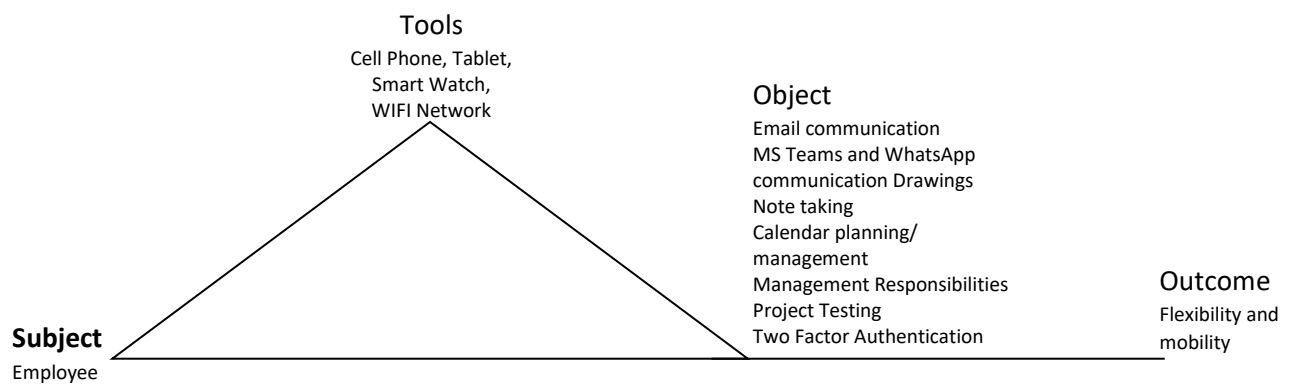


Figure 15: Activity System for Flexibility and Mobility(Affecting the Subject)

According to Zeleny (2007), recognised this as a value add and the findings from the interviews have seem to be in support of this view. Based on the response from the participants, the choice of BYOD device encourages them using BYOD in that it allows them the opportunity to use devices that will be specific to their needs.

Efficiency

This section focuses on efficiency as a benefit of using BYOD. Based on the feedback from the participants, it was found that the participants experience increased convenience from using BYOD. Participants highlighted that the use of BYOD is different from using organisation issued devices, expressing that as users they are more familiar with their personal devices and therefore can complete work tasks more efficiently,

"I think it's a familiarity using my own device is quicker;

"it's convenient, it helps me get things done quick and efficiently...it does allow me to be more of an efficient team player" (TATL);

"I'm just a more concise and more brief and it actually makes me more efficient" (ADM2).

The increased efficiency and the benefit of familiarity in respect to the BYOD device were seen as a positive impact of BYOD use. Figure 16 illustrates increased convenience and efficiency as an outcome in Activity Theory framework. This allows for an understanding of how the "Tool" (BYOD device) betters the activity performed by the "Subject" (employee) to achieve the Object (purpose of BYOD use). How the subject is personally impacted by the use of BYOD in the workplace is depicted as the Outcome in of the Activity System. The components of the Activity Systems relevant to this relationship are shown in figure 16.

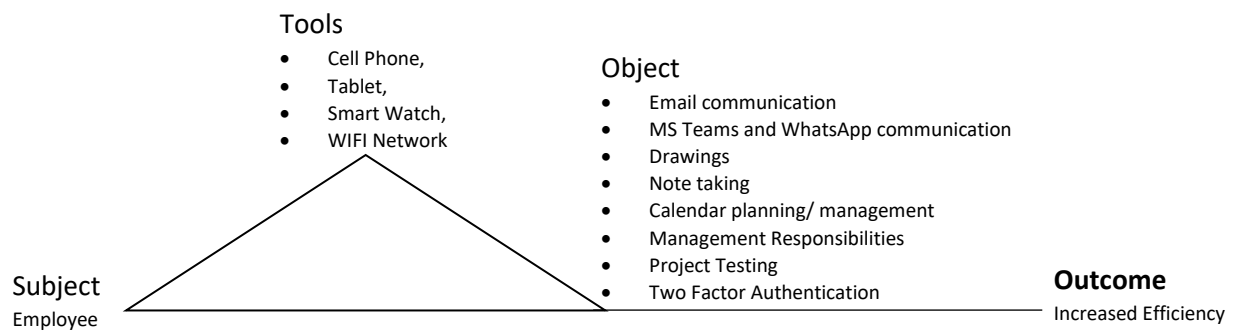


Figure 16: Activity System for Efficiency (Impact)

In their study Waterfill and Dilworth (2014) identified increased efficiency as a benefit of using BYOD in the workplace. They highlighted that when employees use their own devices that are motivated to being more innovative and effective which then results in them being more efficient in their day to day activities.

Autonomy

During the interviews these characteristics of autonomy were positioned with the participants as two different points of discussion. While they were separated during the interviews, they still refer to the influence on autonomy as such the findings from both points of discussion will be documented in this section.

In relation to freedom, the participants responded from different points of view. The interview question focused on freedom in relation to the choice of device that one can adopt for BYOD. Participants mentioned that they felt that they had greater freedom in the choice of device,

“it definitely does I mean technology is always improving, so it does enable one to work more free” (TATL).

In addition to acknowledging freedom in relation to the choice of device, BYOD users also alluded to freedom from the perspective of what they can access on the actual device,

“from your personal device you have the freedom of accessing a lot more, and then being able to manage certain aspects, whether it be from a personal perspective or from a work perspective” (SA).

The data analysis process revealed that participants are of the view that independence and self-sufficiency increase as a result of using BYOD. This has been attributed to the freedom to choose your technology as well as the freedom of working remotely, experienced by the employees and resulting in increased levels of independence gained by the employees,

“funds permitting if you don't like your choice, you can always go to something else” (TTL).

“Self-sufficiency increases from a perspective that you have a higher level of comfort the added convenience and the flexibility” (SA);

Also, the ability to be self-sufficient allows employees the option to work remotely,

“supports the idea of a mobile workforce” (ITA)

“If you're flexible to do things from where you want to, from where you are that would feed into independence and self-sufficient independent” (ADM1).

This study has found that the use of BYOD in the workplace motivates greater autonomy. Greater autonomy has been attributed to advantages such as the freedom of choice in relation to the BYOD device used, the freedom of access to personal and work content on one device, the increased independence and self-sufficiency resulting from BYOD use.

Once again, it is the subject (employee) who experiences greater autonomy as a result of the use of the tool (BYOD). The greater autonomy and advantages of freedom and independence experienced could be seen as positive impact of BYOD use. Figure 17 shows greater autonomy as an outcome in Activity Theory framework, this facilitates an understanding of how the “Tool” (BYOD device) improves the activity performed by the “Subject” (employee) to achieve the Object (purpose of BYOD use). Further to this, the outcome is shown as the impact of BYOD use experienced by the employee as a result of achieving the object. The relevant components of the Activity Systems are shown in Figure 17.

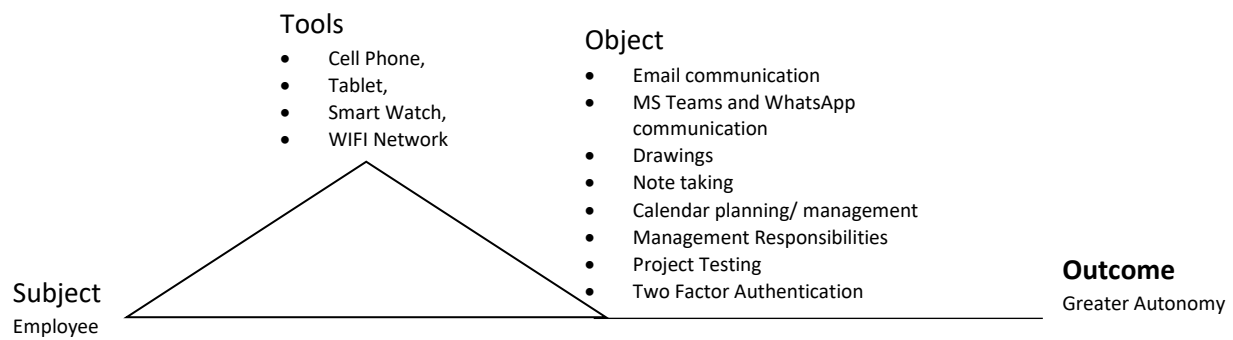


Figure 17: Activity System for Autonomy (Impact)

As discussed by Garba et al. (2015) with increased freedom employees experience greater autonomy. Munroe (2013) suggested the independence in relation to the choice of device gives employees greater autonomy. Based on the documented interviews findings it can be deduced that the BYOD users in the financial institution do experience increased freedom and independence, and ultimately they experience greater autonomy.

Job satisfaction

It was mentioned by the participants that use of BYOD resulted in them being impacted in relation to the levels of job satisfactions. They indicated that the benefits of using BYOD as detailed in previous themes, allow them to experience the increased levels of job satisfaction,

“There's increased satisfaction in that the benefits that come with it, the flexibility that you have; you can work from anywhere and that's something good you don't necessarily have to be in the office all the time” (JD)

Participants also mentioned that when one is efficient (resulting from the use of BYOD) then the levels of job satisfaction will be seen to rise,

“we are able to complete our tasks with greater efficiency which results in increased levels of job satisfactions” (SA)

From the perspective of technology used, the participants indicated that the use of BYOD eliminates frustration resulting from technology used in the office,

“You're not frustrated by having to adapt some generic piece of equipment...you're eliminating the frustration of dealing with that problem at hand” (TTL);

“I sometimes feel more productive because I'm aware of what's happening without being that closer team so think it's increased job satisfaction” (ADM2);

“it has improved my job satisfaction...which means that you are happier at work, because you are able to actually do the other activities.” (ITA)

Flexibility, efficiency, ease of use and the increased levels of happiness have been seen as factors contributing to the increased job satisfaction. The increased job satisfaction could be seen as positive impact of BYOD and shown as the outcome in Activity Theory framework, depicted in Figure 18. Once again, the subject-tools-object triangle is included, since it is the subject (employee) who is affected by the use of a tool (BYOD) to perform an activity.

As a result of achieving the object, the “Outcome” (impact) is experienced by the employee. This theme was mapped to the Activity System Figure 18, to reflect the relevant components.

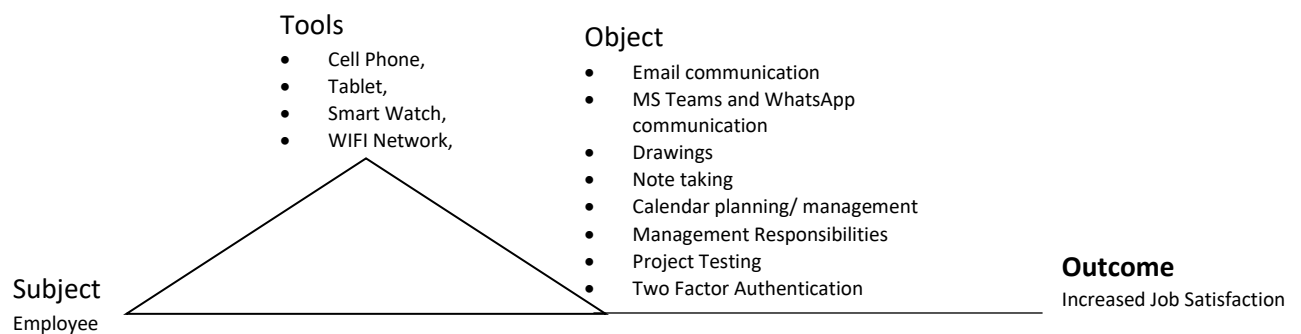


Figure 18: Activity System for Job Satisfaction (Impact)

Dilworth (2014) indicated that the flexibility and mobility allows for better productivity which in turn results in increased job satisfaction. These findings are supported by the literature in a study by Garba et al. (2015), who suggested that job satisfaction is directly related to the resources provided to the employees, if the organisation provides the best technologies or allows for BYOD then employees will be more willing to commit. The findings of this study have supported the results of previous studies.

Cost Implications

Bring your own device as a phenomenon refers to the concept of using one's devices to perform work-related activities. As these are personal devices it can be assumed that the device is bought and maintained by the owner (employee), as such all cost incurred as a result of purchase, maintenance and use of the device is at the employee's expense. The participants were quick to highlight cost as one of the challenges that they have been exposed to since using BYOD. The cost concerns were raised based on the participant's experience, despite this disadvantage the employees confirmed that the choice of using BYOD was not enforced by the organisation but rather a personal choice that was encouraged by the organisation,

"It's very much voluntary...there's no mandatory requirement that you have to use BYOD. It's on a voluntary basis and when it is, they provide the security framework for that" (TTL)

"So, we're not forced to do it" (ADM1)

The participants use their devices primarily for communication, it was fitting that they spoke to the cost of data,

"data that's like a cost me myself" (JD);

"using your paid data" (SA);

"the cost and data loss which are essentially high on the list" (ITA);

"Unless you've got a company issued SIM card or data allowance or whatever. You have to pay for the data usage, out of your own pocket... It can get it can become a costly exercise" (ADM1).

While employees in the organisations sometimes use their device frequently throughout the day and sometimes on weekends, there is not subsidised contribution from the organisation made to the employee for the use of BYOD. Cost implications were found to be a disadvantage to the employee and therefore could be seen as negative impact of BYOD use. This negative impact is depicted as outcome in Activity Theory framework, shown in Figure 19. In relation to the cost incurred by the employee; the use of the "Tool" (BYOD device) in the workplace could hinder how the device is used by the Subject (employee) to achieve the Object (purpose for BYOD use). Figure 19. provides the part of the Activity System found to be pertinent for this theme.

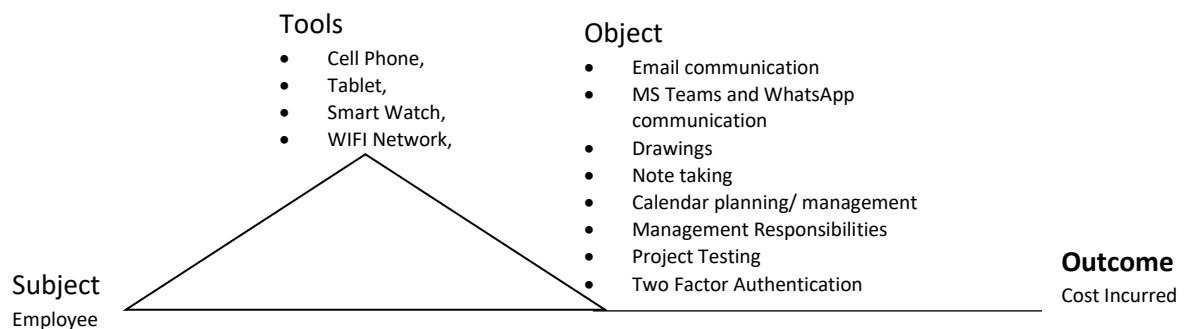


Figure 19: Activity System for Cost Implications (Impact)

The cost implications identified in this study support the findings by Weeger and Gewald (2014), who highlighted that it is not the responsibility of the organisation to purchase and maintain personal devices, irrespective of how it is used and who is to benefit from the use.

Work-Life balance/overlap

Managing the shift between work and private-life related activities came across as a challenge for some of the participants. Due to the constant access to your device at any time of the day it appears that setting defined boundaries between the different aspects of one's life has proved to be a challenge. Participants had a firm response to the work-life, expressing that they have experienced overlap as a result of using BYOD. With your device on your person at all times, one can struggles to switch of, they are exposed to everything that is happening around them in relation to the teams that they fall under.

From a team perspective it was highlighted that because team members know you are contactable at all times on your personal device, they sometimes do not have the restrains for not contacting you at times where you are supposed to be off work,

"in the past...when you get home at six o'clock at night work would be second thought until tomorrow morning eight o'clock, but now people are well aware they can get access to you on your own device, they have access to you via WhatsApp or email, and they will execute those activities at any time of the day." (ITA)

Some participants indicated that they have measures in place to manage the balance, however they are still attentive to work communications in order to monitor any urgent matters,

“I’ll spend a bit of time on it, but 15 minutes or 30 minutes just to sort of answer the question and to resolve the question...the actual work will get done when I get to work” (TTL).

“I think it’s a personal thing, it depends on whether you are able to separate the urgency of certain things, but it is at times difficult to manage it because it’s overwhelming...urgent things or critical things that needs attention and then you tend to extend your workday” (ITA).

It was mentioned by the participants that they find themselves working beyond the standard working hours and this has had a negative effect on family life,

“it reduces the amount of time and that you have to spend with your family” (ITA);

“there is definitely an overlap. So, you could get tempted into doing work in your personal time” (TTL);

“getting a message of an urgent issue while you’re having dinner, you can easily just stop and jump onto your laptop to fix the problem which obviously is taking up my time with my family they would not be happy about that.” (JD)

Based on the interviews conducted it was found that BYOD use could result in a conflict between one’s work and personal life. This has been identified as a disadvantage of BYOD use and therefore could be seen as negative impact of BYOD use. This impact is illustrated as an outcome in Activity Theory framework, as is shown in Figure 20 and Figure 21.

Figure 20 shows the part of the Activity System with the relevant components. It illustrates how the “Subject” (employee) performs work-related activities is mediated by the “Community” (Employee Interaction) to achieve the Object (purpose for BYOD use), the results of which are translated into the Outcome (impact).

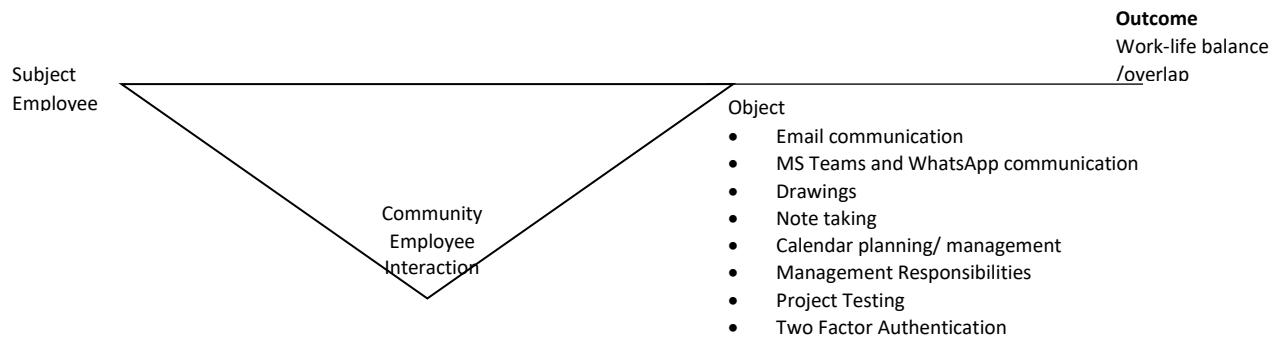


Figure 20: Activity System for Work-Life Balance/overlap mediated by Community

Figure 21 shows the part of the Activity System with the Tool as the mitigating component. It is understood that how the “Subject” (employee) performs work-related activities is mediated by the “Tool” (BYOD device) to achieve the Object (purpose for BYOD use), the results of which are translated into the Outcome (impact).

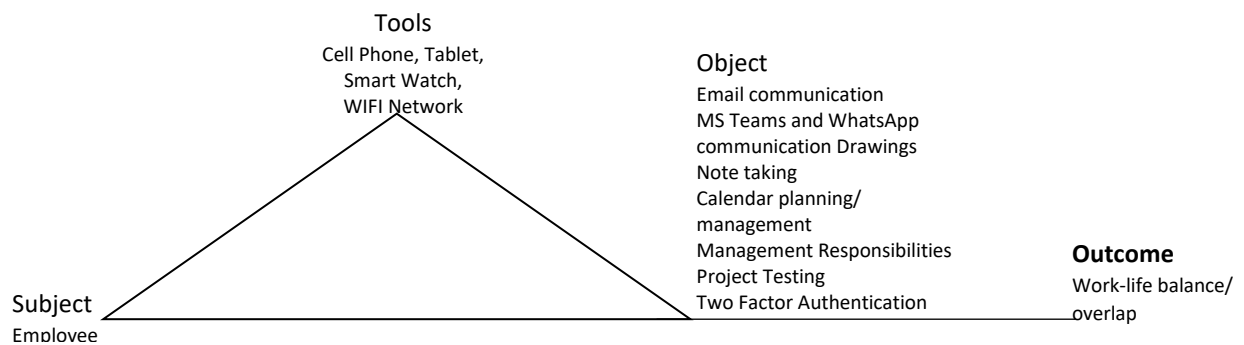


Figure 21: Activity System for Work-Life Balance/overlap mediated by Tool (Impact)

While BYOD allows for flexibility and greater autonomy, it also introduces feelings of anxiety and employees can be overwhelmed by the work-life overlap. Previous literature identified the lack of boundaries between business and private lives as a disadvantage of BYOD (Mitrovic et al., 2014; Schalow et al., 2013).

Anxiety

Participants mentioned that the use of BYOD has an impact on one's levels of anxiety. While measures to "drawing the line between work time and home time" (JD) were established by the participants having access to work content at all times has been identified as a disadvantage in that it increases the levels of anxiety experienced by the employees.

"I struggled to switch off work...I actually removed the notification sync to my watch which lessens the anxiety a bit as I now use my cell phone" (ADM1)

"anxiety in anticipation of known issues arising from the office while you are at home" (SA)

"That gives me anxiety" (ADM2).

Based on the interviews conducted it was found that BYOD use could result in an increased level of anxiety experienced by the employees This has been identified as a disadvantage of BYOD use and therefore could be seen as negative impact of BYOD use. This impact is illustrated as an outcome in Activity Theory framework, as is shown in Figure 22 and Figure 23.

The activity system in Figure 22 shows the relevant components, it illustrates how the "Subject" (employee) performs work-related activities is mediated by the "Community" (Employee Interaction) to achieve the Object (purpose for BYOD use), the results of which are translated into the Outcome (impact).

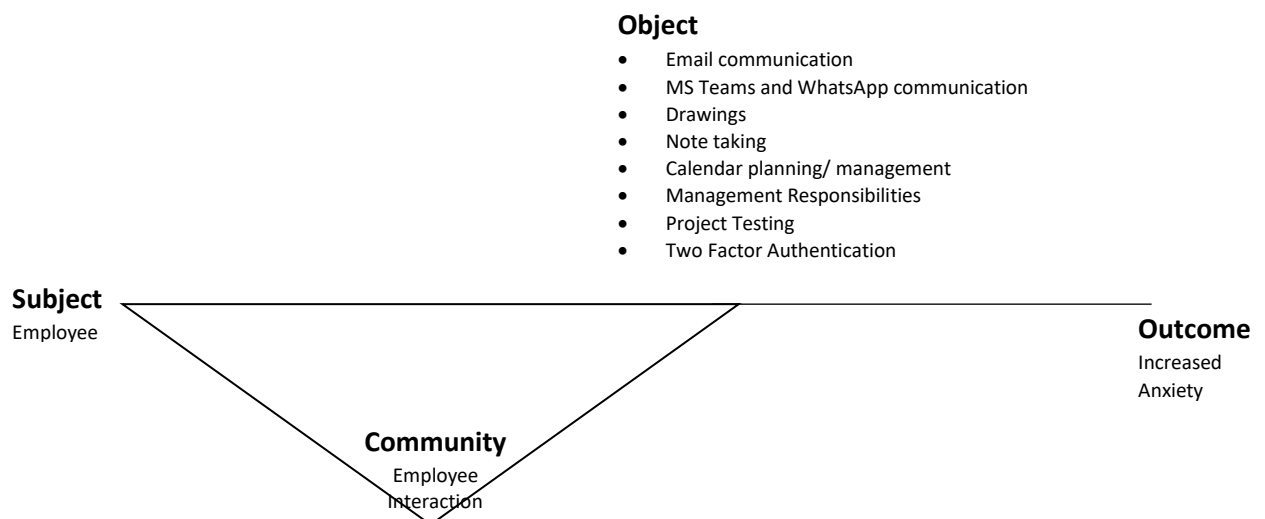


Figure 22: Activity System for Anxiety mediated by Tool (Impact)

Figure 23 shows the part of the Activity System with the Tool as the mitigating component. It is understood that how the “Subject” (employee) performs work-related activities is mediated by the “Tool” (BYOD device) to achieve the Object (purpose for BYOD use), the results of which are translated into the Outcome (impact).

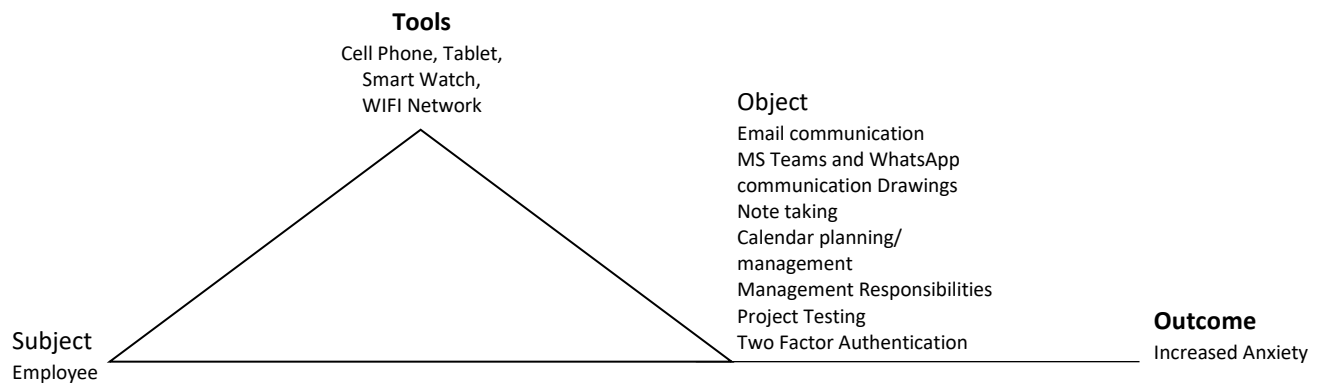


Figure 23: Activity System for Anxiety mediated by Tool (Impact)

Anxiety as a theme was based on the participant’s responses, raised as a concern specific to them as a result of BYOD use, no previous studies were found in relation to anxiety for BYOD use in the context of this study, however, as mentioned by Weeger, Wang and Gewald, (2015) an increase in anxiety influences the employees’ use of a device.

Privacy and security

Feedback from the interviews revealed that majority of the participants were concerned about their privacy as well as the security measures guiding the use of BYOD within the organisation. This section presents the participant’s responses in relation to this theme as well as its mapping on to the Activity System. It was suggested that the organisation has implemented rules to guide BYOD use by employees.

Despite the rules being in place it seemed that awareness was a challenge, with some participants indicating that they were not familiar with the rules,

“I definitely know that there are rules and policies in place. I haven't read any of it” (TATL);

“I know there's like a lot of policies in place for like the QA team but not for the purposes that I use my device if there is I'm just not aware of it” (ADM2).

The participants also highlighted that the organisation has not sufficiently surfaced the rules to them, *“they have not necessarily been communicated to their entirety, the existence of policies has been communicated, however the specifics of these policies and not BYOD should work have not yet been communicated”* (TTL);

“I can say they've been formally communicated and adopted by the organisation. I do believe I've seen an email or two regarding that I just didn't give it the time to go through it.” (TATL)

These participants were apparently not aware of one of the documents collected from the bank as supporting evidence for this research – shown as “Security Policy” in table 5. This document details the relevant rules and security legislation that the participants are aware of, but “haven’t read any of”.

Some participants mentioned that the rules did not require them to action any responsibility, but rather system / application driven,

“So, I'm not aware of any rules I don't also think that the explicit rules that you as an individual should abide by... organisation's data and how you as an individual handle that data is driven or protected by the applications” (ITA);

“they only manage certain software on the phones remotely...they do that through AD, so your AD account expires you suddenly don't get your OneDrive” (TTL);

“there's some certificate thing that you have to import onto your device and only after you've done that successfully then it will allow you, and you've changed the passcode, then it will allow you to access to email...You need to consult the policy documents” (ADM1).

It appears that BYOD use in the organisation is guided by the use of recommended software applications as well as an authentication (two-factor authentication, 2FA) process was required from the employee,

“Depending on the application you are accessing, two-factor authentication (2FA) may be required before access is granted” (TTL);

“you first need to download this app, get it approved on your app” (TATL)

This was confirmed in internal communications by the organisation as per the following abstract:

As part of Bank A's security drive, Second Factor Authentication (2FA) will be implemented across Bank A. 2FA is the authentication of a user by confirming a user's sign in request via Bank A's App when accessing Bank Systems.

In addition to the lack of awareness, the participants mentioned security and privacy concerns to include; loss of data,

"if the phone thinks you are tampering with the password...fail to identify yourself in that process then it wipes the content of the entire device, private and professional data" (ITA);

"they have the ability to erase all that information without your consent without your knowledge" (JD);

"policy is quite it's quite strict and I think it's very intrusive" (BA).

Secondly, participants mentioned that the organisation restricts the personal use of their device,

"you can't copy that data and then move it to another platform, like WhatsApp. That's software doesn't allow you to do... this could cause a delay in finalisation of the conversation" (ITA);

"if you have OneDrive on your phone for work, you can't use another app like the Gmail app to send data from the OneDrive won't allow you to do that" (TTL).

This was confirmed in internal communications by the organisation as per the following abstract:

A new Bank A mobile security and compliance policy is being applied...to all private devices that access company data, including email and other Office 365 services. The process is automated. At the time of the change, when accessing your email or other Office 365 service from your mobile/tablet, your device will prompt you to install the Portal app, and to accept a new device management profile. Please follow the prompts.

Privacy and security concerns and the disadvantages of the lack of awareness, the potential loss of personal data and the device restrictions were seen positive impact of BYOD use.

Privacy and security has been mapped as an outcome in Activity Theory framework. The lack of employee awareness was mapped to the "Subject" component while it was found fitting that the security measures implemented by the organisation be mapped to the "Rules" component. As per the activity system, how the "Subject" (employee) adopts to use the "Tool" (BYOD device) mediates the achieving of the "Object" (purpose of BYOD use).

Figure 24 illustrates the activity system in relation to the lack of awareness as it influences the subject's need to adopt BYOD for work-related activities.

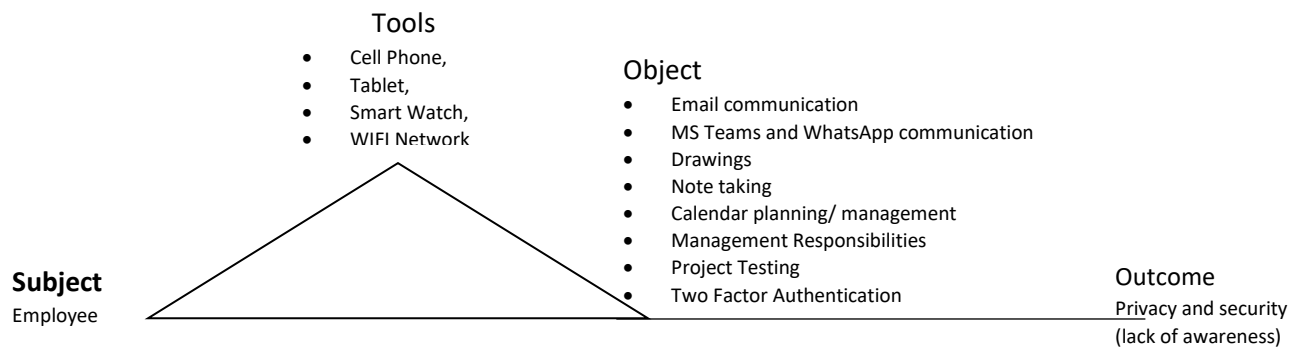


Figure 24: Activity System for Privacy and Security (Affecting the Subject)

As highlighted in literature, Adedolapo and Kabanda (2016) suggested that the use of BYOD is impacted by organisational and environmental factors. They correlated environmental factors to include policies, security, awareness, supporting industries and government support. From the interview findings discussed in this section, the participants spoke to concerns regarding policies, security.

As a result of the security measures in place, employees can be exposed to loss of data. As per the activity system, the “Rules” (MAM, MIM) mediate how the “Subject” (employee) performs activities to achieve the “Object” (purpose of BYOD use) within the organisation. The employee is influenced by these rules when performing activities. This relationship between the components is aligned to the relevant part of the Activity System, as illustrated in Figure 25.

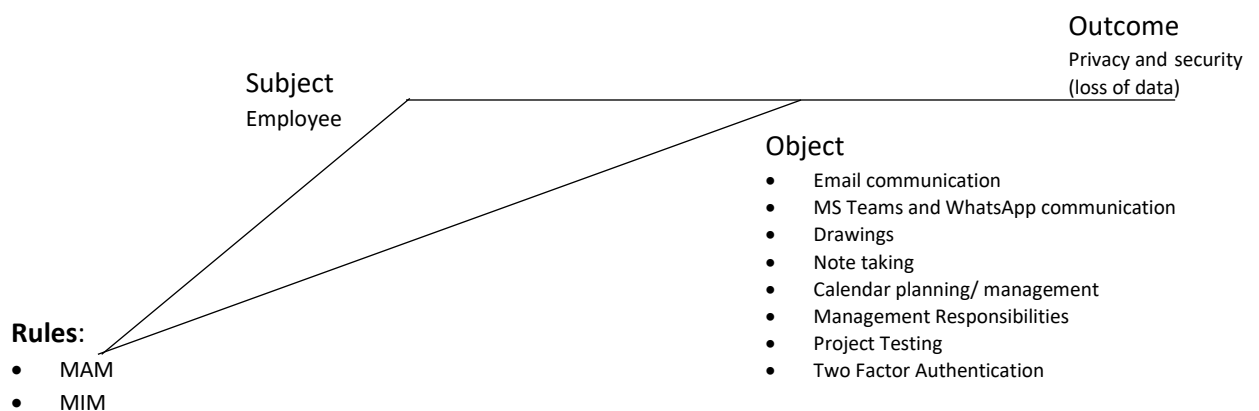


Figure 25: Activity System for Privacy and Security (Affecting Rules)

The concerns raised by the participants supports Ostermann (2018), who stated that organisation implements guidelines and policies to prevent the loss of organisational information, however, the loss of personal data is possible when employees use their own devices for work activities.

The device restrictions on BYOD use have been found as being a negative impact of BYOD use on the employee. It is depicted as an outcome in Activity Theory framework as illustrated in Figure 26. The part of the activity system depicted in Figure 26, provides the components relevant to this perspective of the privacy and security theme.

This illustration assists in the understanding of how the “Subject” (employee) performs an activity to achieve and “Object” (purpose of BYOD use) while mediated by the “Rules” implemented by the organisation.

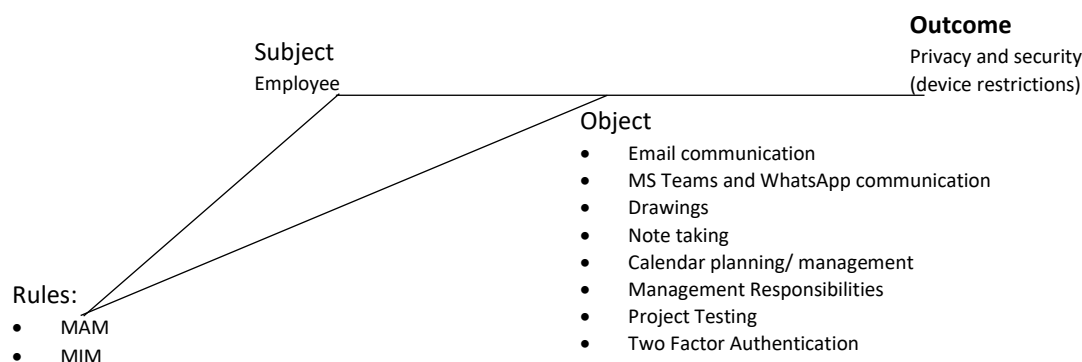


Figure 26: Activity System for Privacy and Security (Impact)

Based on their responses the researcher was able to elicit the levels of awareness in relation to the rules guiding the use of BYOD. The participants were aware of the existence of rules, even though they had not read the rules themselves. The document shown as “Security Policy” in table 5 confirms the existence of these rules. This document describes applicable aspects of the Mobile Application Management (MAM) and Mobile Information Management (MIM) security models that have been implemented by the bank for BYOD security purposes.

The third document, the software installation guide, discusses the enforcement of security when an employee accesses company data via their personal devices. This is in line with mobile information management in that it allows the company the ability to control how employees access company related data.

Mobile device policy, as described in the MDM document, aligns with mobile application management (MAM) as it details the controls that the employee will need to ensure before downloading/using certain applications on their devices. According to Smith (2017, 406) employee's personal data could be "subject to exposure, alteration, or deletion" as a result of the organisation having applied MAM. The participants supported Smith's findings as they mentioned that the organisation has "...the ability to erase all that information..." (JD); and the opinion is that the policies are "very intrusive" (BA).

5.4 Findings aligned to Conceptual Framework

The conceptual framework adopted in this study is the third generation Activity Theory (Engeström et al. 1999). The unit of analysis referred to the actual activity performed by the employee, Activity Theory (AT) as a System consists of 7 components; Subject, Tool, Object, Rules, Community Division of Labour, and Outcome. Based on literature the components were defined as depicted in Figure 4 on page 27. On documenting the findings, the components were refined in order to align to the current study, this refined activity system is illustrated in Figure 27.

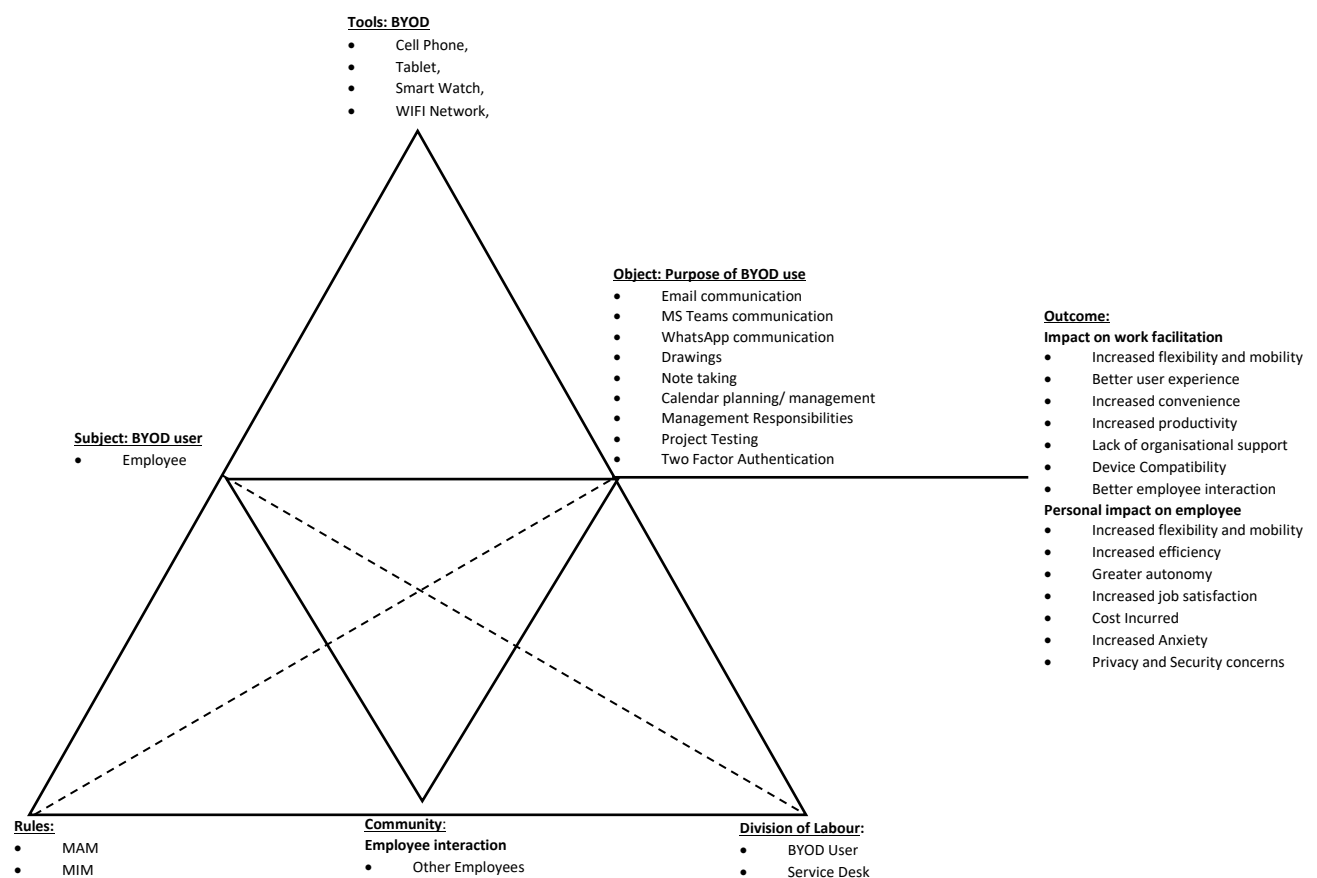


Figure 27: Activity System components based on research findings

The **subject** in this context are employees that, at that at the time of the data collection, worked at the organisation and had been using BYOD. The findings revealed that the employee is shaped by the benefits and concerns of using BYOD. The option of choice to using BYOD, the experience are the features that influence the employee to using BYOD.

The **object** in this activity system was assumed, based on uses of BYOD discussed in previous studies, to include email access; WhatsApp messenger; document storage, retrieval and sharing; web conferencing; two-factor authentication; conversations and internet access. In line with previous studies the employees who participated in this study mentioned that they use BYOD for email access, WhatsApp communication (as well as other platforms such as Microsoft Teams), and two-factor authentication. They also indicated that they use BYOD for free hand drawings and note taking in meetings, calendar planning and management, management responsibilities such as leave and claim approvals and project testing.

In the current activity system, the **tool** referred to the devices that employees choose for BYOD. The tools identified in this study included: the employee's personal cell phone, tablet, smart watch, WIFI network, and laptop. While the laptop was identified as one of the devices used for BYOD, the participants mentioned that they personally do not use their personal laptops, however they are aware of other employees within the community that are.

Based on previous studies the **rules** in the activity system were based on rules known today resulting from rules defined for mobile devices in general. No rules were found in literature specifically focusing on the use of BYOD. In the current activity system, the participants were unable to specify the rules, however based on how they know the implementation of the rules to be, the researcher deduced the applicable rules.

Participants suggested that they were not expected to action any of the rules as the systems implemented by the organisation provide the necessary implementation. They also indicated that when one opts for BYOD then the software applications that can be installed in the device are vetted to ensure that they do not conflict with the applications required and recommended for BYOD.

Based on the interpretation of the rules, this suggests that the organisation has implemented a mobile application management policy (MAM). MAM is applied to specific applications on a device rather than the entire device. The MAM system provides IT administrators the ability to monitor and control organisation related applications on mobile devices (Tewari et al., 2015).

The second policy that was deduced from the interviews is the implementation of mobile information management. Evidence in this study revealed that the organisation has policies in place to restrict how information is shared between the different applications on the device. MIM protects the organisation's information by focusing on data integrity and encryption as well as the sharing of the information (Downer, K. and Bhattacharya, 2015). Based on the above the current activity system has been updated to reflect the rules as MAM and MIM.

For the purposes of this study the Employees who benefit from ones use of BYOD were identified as the **community**. To gain a better understanding of the community focus was on the interaction between the Subject performing the activities (object) and the other employees in the organisation who also use BYOD. The use of BYOD was highlighted as voluntary, which meant that no chain of approval was required when setting up for BYOD. Participants did however mention that the service desk officials are available where assistance is required for setup. Based on this the division of labour focuses only on the BYOD user as well as the service desk team as without the user and the support team the setup process could be hindered.

The **outcome** on the activity system has been identified as the impact of BYOD on the subject. The BYOD user performs an activity using BYOD and mediated by the rules, community as well as the division of labour. It is important to understand how the BYOD user is impacted as a result of having performed the activity using BYOD. This study found that the impact can be categorised as increased efficiency, greater autonomy, increased productivity as well as increased job satisfaction.

5.5 Summary

The focus of this chapter was on the findings as they were transcribed from the interview audio recordings and have not been amended in any way, the themes grouped based on how they best addressed the research questions.

Firstly, the themes were grouped into those relating to the work facilitation aspect of the research. These themes best highlighted the benefits and challenges of using BYOD. The study has revealed that the positive impacts of BYOD for employees of the financial institution on work facilitation were; Increased flexibility and mobility, Better user experience, Increased convenience, Better employee interaction, Increased productivity. The negative impacts were; Insufficient organisational support, and Device compatibility issues.

Secondly, the last few themes detailed in this section were focused on the impact of using BYOD. Positive personal impact of BYOD for employees of the financial institution were found to include; Increased flexibility and mobility, Increased efficiency, Greater autonomy, Increased job satisfaction. While the negative impacts included; Cost Incurred, Work-life overlap, Increased Anxiety, and Privacy and Security concerns. It has been noted that increased flexibility impacts both work facilitation as well as the employee directly. Lastly, the findings were aligned to the activity systems as it is defined in this study.

The following chapter discusses the researcher's interpretation of the findings.

6. DISCUSSION

Since as early as the year 2004, research has been conducted on BYOD as a phenomenon. Many of these studies aimed at exploring and understanding the implications of BYOD from an organisation's perspective. Limited studies have been conducted to understand the impact of BYOD from the perspective of employees; as a result of this the researcher of this current study identified a gap in knowledge. In an attempt to address the gap in knowledge the researcher embarked on this study, aimed at exploring the impact of BYOD on employees in a financial institution. The below sub-research questions were defined in order to assist in addressing this research.

1. What do employees of the financial institution use BYOD for?
2. What are the positive and negative impacts of BYOD for employees of the financial institution?

In this chapter the findings from the data collected and presented in Chapter 5 are discussed and interpreted. This chapter provides the overall summary of findings and the reflections based on the researcher's interpretation of the findings. The relevance of the themes is discussed and thereafter the researcher interprets the findings in relation to Activity Theory. The last section of this chapter provides a summary of the discussion.

6.1 Discussion on RQ1

The BYOD phenomenon, as discussed in Chapter 2, is acknowledged by organisations (Saret, and Weed, 2012) but it has been driven primarily by the employees (French et al. 2014). BYOD is fast becoming a norm rather than an exception in the workplace (Crossler et al., 2014). Understanding the purposes of BYOD use in the organisation was important for addressing research question 1: RQ1: *What do employees of the financial institution use BYOD for?*

The employees introduced into the organisation a multitude of personal devices, as summarised on Table 6 on page 49, which allowed for the facilitation of work activities, detailed on Table 7 page 51. The most preferred BYOD device was found to be the cell phone and it appeared that this device was most used for communication purposes, which included email and instant messaging (e.g: WhatsApp). Other devices used included; tablet, smart watch, and WIFI Network. While there are a number of personal devices used by employees for work activities, none of the participants indicated that they were using their personal laptops. This could be attributed to the fact that the organisation is currently issuing laptops to the employees.

Aside from communication, there were several other purposes for which BYOD is used. The specific activities performed by each participant seemed to be influenced by their roles within the organisation. For example, only the participants in management roles mentioned that they perform tasks such as 'leave and claim approvals' and only the participant in a testing role highlighted that they perform 'project testing' on their device. Employees in analyst roles were found to also use BYOD to manage their calendars, while those in technical roles used BYOD for note taking and drawings. Only one participant appeared to be using BYOD for two-factor authentication

Participants were unable to quantify the time spent on BYOD in minutes or hours. However, they highlighted that BYOD use was frequent as they continuously checked their devices for work communication even on non-working days. Some of the purposes for BYOD use mentioned in literature, namely 'email' (Meske et al., 2017); 'instant messaging' specifically WhatsApp (Veljkovic, 2018); and 'two-factor authentication' (Ni et al., 2016) were found to be performed by the participants of this study. The employee activities 'document storage, retrieval and sharing' (Mahatanankoon, 2015) and 'web Conferencing' (Kerravala and Michels, 2015) were also mentioned in the literature as purposes for BYOD use, however these were not found to be performed by the participants.

Note that it cannot be confirmed that all possible BYOD devices or purposes of BYOD use in the financial institution have been surfaced in this study. New technologies are constantly being introduced into the working environment; it is therefore possible that employees in other teams and other roles within the organisation are using devices not mentioned in this study for more than the mentioned purposes.

In summary, in addressing RQ1: *What do employees of the financial institution use BYOD for?*, the researcher was able to establish the types of devices used, the frequency of use as well as the purpose for which the participants use BYOD. It appeared to be that there is a range of devices that could be used by employees for BYOD. The use of these BYOD devices was found to be frequent throughout the day as the employees aim towards achieving their daily work activities.

The following section details the discussion with regards to research question (RQ2).

6.2 Discussion of RQ2

It was important for the researcher to explore what the employees identified as benefits and disadvantages of BYOD use in the workplace. The benefits and disadvantages were aimed at understanding the impact of BYOD use in the facilitation of work activities as well as the personal impact that the use of BYOD has on the employees. This section of the discussion allows for the interpretation of the findings in order to address RQ2: *What are the positive and negative impacts of BYOD for employees of the financial institution?*

6.2.1 Impacts of BYOD for employees of the financial institution on work facilitation

Certain of the benefits and disadvantages of using BYOD that are discussed in the literature, can be seen as factors that impact the employees in relation to the facilitation of their work activities. This section will discuss the themes relevant to those benefits and disadvantages of using of BYOD as they were found in the interviews.

Positive impacts on work facilitation

This study found that many of the benefits already identified in literature, specifically: increased flexibility and mobility (Gens et al., 2011; Garba et al., 2015), better user experience (French et al., 2014), increased convenience (Waterfill and Dilworth, 2014) as well as increased productivity (Magruder et al., 2015) and better employee interaction (Adedolapo and Kabanda, 2016) were applicable to the participants.

Flexibility and mobility was found to be the most prevalent benefit of BYOD use. It was suggested that flexibility and mobility could be categorised into three types: flexibility and mobility in the office, flexibility and mobility when working remotely and flexibility in the choice of device. For some of the participants a lot of their working day is spent coordinating on project deliveries and attending meetings (*"Besides having multitudes of meetings...I am equivalent to a consultant"* (BA); *"most of my days meetings with the business trying to assist them"*). In ensuring that they are able to deliver on their work activities, it was deemed important that employees were not confined to their desks during working hours. The flexibility and mobility afforded to them by their BYOD devices enabled this.

BYOD allows employees the flexibility and mobility to work remotely. They can work at any time and from anywhere and still access the organisation's network, this seems to encourage a virtual workspace while still being connected to the rest of the team. Employees also have the flexibility of choosing a device that they are familiar with, one device that encourages ease of use and allows them the opportunity to ensure that both personal and work technology needs are catered for. The flexibility and mobility allows for the opportunity to work in the office or outside office. Brodin (2016) suggests that employees experience increased productivity as a result of working from anywhere at any time, this is supported by the current study.

Better **user experience** and **increased convenience** were identified in this study to be positive impacts of employee BYOD use on work facilitation. It is suggested that with BYOD employees experience an increased level of comfort and competency in their daily work activities because they are familiar with their devices (Weeger, Wang, and Gewald, 2015), the results of this study support the suggestion. Better user experience has been known to encourage technology acceptance (Weeger and Gewald, 2014). Increased convenience was mentioned by Kabanda and Brown (2014) to be a value add to employees using BYOD. The continued use of technology is found to be dependent on how usable the employees find the device to be.

It was shown that the use of BYOD allows for **better employee interaction** as it enables prompt communication. With BYOD, employees do not have to wait for long periods of time for feedback or assistance, in that way they are able to adequately perform their work activities. While BYOD does not encourage face to face interaction, it seems to allow for better communication and better information sharing.

This study found that BYOD results in **increased productivity** for the employee. It stands to reason that the previously identified benefits for employee work facilitation (flexibility and mobility, better user experience, convenience, and increased productivity) would result in better productivity, simply because they all facilitate work. Participants acknowledged that advantages such as better user experience and increased flexibility of BYOD use enabled them to complete tasks "*quick and efficiently*". The comfort, ease of use and promptness of using BYOD that was mentioned earlier can also be associated with the higher levels of productivity experienced by the employees. The fact that employees can perform personal and work activities on a single device suggests that they do not have to switch between devices.

This ultimately implies that the employees are able to save time even between tasks. It is suggested that employees are able to use BYOD for the purposes of achieving their work goals, this in turn allows them the opportunity to be productive. The themes 'flexibility and mobility', 'user experience', 'convenience', 'employee interaction' and 'productivity' are positive impacts of work facilitation experienced by employees who use BYOD for various work-related purposes. These positive impacts encourage the use of BYOD by employees.

Negative impacts on work facilitation

Disadvantages for work facilitation experienced as a result of BYOD use were 'device compatibility' and 'organisational support'.

While **device compatibility** was not found to be a disadvantage in literature, participants in the study indicated that it does impact how work activities are performed. Employees know what they expect from their devices in order for the adequate facilitation of work and it has been indicated that there are *"constraints as to what software applications will work on the personal device"*. These constraints contribute to the employee's decision of the type of personal device that they wish to buy, and they negatively impact on how work is facilitated. Fundamentally the choice of what personal device employees chose to purchase should not be influenced by the organisation, however it appears that to ensure you can get all the required applications recommended for the purposes of BYOD use the organisation does have some influence.

In order for employees to successfully adopt BYOD there is a level of assistance and support required from the organisation. This study revealed that **organisational support** was provided by the organisation to the employee when setting up for BYOD. However, once setup has been completed there is no support structure available to help when the use of BYOD proves to be a challenge. It is not clear at this time whether the support provided by the organisation is altogether inadequate or the employees using BYOD are unaware of the channels to follow in order to receive the required assistance.

The concerns relating to device compatibility as well as the lack of organisational support are seen to be negative impacts to work facilitation. If not managed adequately they could result in employees being reluctant to use BYOD for work activities.

BYOD vs Mobile organisation devices on work facilitation

This study has provided the positive and negative impacts to facilitate work in relation to BYOD use. This section of the research paper provides the researcher's interpretation of the positive and negative impacts of BYOD compared to organisation issued devices.

Employees are assigned laptops in order to facilitate their daily work activities. As stated by Gustav and Kabanda, (2016) laptops are categorised as mobile devices, providing users with the option of moving around with the device. As with laptops, BYOD allows the employee the opportunity to work away from their workstation including working away from the office. This indicates that as much as the benefit of **increased flexibility and mobility** has been identified in relation to BYOD use, this benefit could still be experienced from the organisation issued device as this device is the laptop.

When compared to organisation issued devices personal devices are preferred by employees. Considering the participants responses, it could be understood that BYOD ensures that the employees gains more value as compared to when they use organisational issued devices "*there is much more value or higher user experience when you use your own device*". This indicates that employees find **better user experience** through using BYOD as opposed to the organisation's laptop. Employees have expressed that without their devices they would need to "*go back home*" rather than to spend the day at work without their personal devices.

It is presumed that when employees have their devices with them, they are able to perform their work-related activities with confidence as they are comfortable with their devices and they have the benefit of **better user experience**. It has been mentioned that without BYOD employees feel as if they are "*flying blind*". This highlights the notion that without their devices they are able to continue with work on the organisation issued devices, however not producing the amount of work as one would expect if they had their own devices. This leads to the understanding that BYOD results in more productivity than the organisation laptop. Considering that the most used device is the cell phone and the common activity is communication, BYOD can be deemed as the better option when compared to the organisation issued device.

The organisation ensures that the applications required for facilitating the work are available on the laptop given to the employee. In addition, all necessary on-going support is provided to employees using the laptops. As such where employees opt to use only the organisation issued device, the negative impact of incompatible devices or lack of **organisation support** would be minimal if any.

6.2.2 Personal impact of BYOD for employees of the financial institution

A previous study stated that BYOD impact on employees relates to increased/decreased employee productivity, efficiency, satisfaction and employee attitude (Waterfill and Dilworth, 2014). This study revealed that the employees experience improved convenience and efficiency, greater autonomy, increased productivity as all as increased job satisfaction, however no findings surfaced in respect of the impact on employee attitude.

Discussed in section 6.2.1, are the positive and negative impacts of BYOD use in the workplace on work facilitation. Based on the results of how work facilitation was impacted, the employees find that they are personally impacted. Where BYOD use positively facilitates work activities the experience a sense of accomplishment and ultimately are able find valuable outcomes for themselves in the process. Where work facilitation was negatively impacted, employees will in turn find that they are negatively impacted while using BYOD. It was apparent that the BYOD users experience both benefits and disadvantages when using BYOD. These benefits and disadvantages seem to contribute to whether the employees chose to use BYOD or not.

Positive impacts on employee

It is evident in the study that the employees experience some comfort regarding the technology they use in the workplace as a result of BYOD. Employees find that the easy access to the device and the comfort experienced while using BYOD makes things easier, *“using my cell phone is actually made my life easier”*. For these reasons, employees have experienced **increased convenience** when using BYOD for work-related activities. From an employee perspective, **improved efficiency** is experienced as an outcome/impact of having performed a task.

The study has found that in addition to the increased freedom and increased independency employees have experienced increased levels of self-sufficiency, these benefits have been associated with **greater autonomy** as a positive impact on the employee. This is accumulated from a number of other benefits stretching from **flexibility and mobility** to being impacted as a result of increased convenience. The ability to use BYOD allows employees to work from anywhere and not necessarily within the organisation's premises.

Employee **job satisfaction** does not exist on its own. It is when employees are impacted in a multitude of positive ways that they are found to experience job satisfaction. Where employees are negatively impacted it would be difficult ascertain increased job satisfaction as a result. As discussed by Obisi and Gbadamosi (2017), when employees have the right tools to perform the tasks assigned to them then the result thereof would be increased job satisfaction.

Negative impacts on employee

Throughout this research benefits of BYOD use have been mentioned; however it was also found that the employees are negatively impacted by the use of BYOD. The themes dominating this section of the discussions include cost implications, work-life overlap, increased anxiety, lack of support, as well as incompatible devices used.

The **cost implications** are a concern for the employees. The most common cost implications have been suggested to be relating to the cost of *"using your paid data"*. This is supported by the understanding that the most performed activities are for communication purposes. Employees need to access, download, upload content on emails or via instant messaging and these activities do cost data. While WIFI is made available by the organisations the *"WiFi restrictions within this organisation"* make it difficult to perform some activities which means that employees still need to use their personal data. Considering that for eight hours in a day they are performing work-related activities, the data cost incurred for work activities appears to be substantial.

The cost incurred was also attributed to an organisational influence on the flexibility of choice of device. This was based on the understanding that employees consider the software applications recommended by the organisation when purchasing their personal devices. This leads to the view that employees purchase devices that would be able to cater for more than what they would have needed if the device was strictly for private use.

Concerns relating to the overlap of work into one's personal life surfaced, during the interviews, with great importance. It seems that while BYOD use allows for the benefit of increased flexibility and mobility, employees are spending longer hours in a day on work-related activities, even when they are at home. This **work-life overlap**, which is attributed to the flexibility and mobility benefit, appears to be *"difficult to manage it because it's overwhelming"*. As a result of the overlap the employee is negatively impacted by BYOD use. Consistently having access to work communications has been found to result in employees *"feeling anxious"*. The **increased anxiety** could result in decreased adoption of BYOD by employees as mentioned by Weeger et al., (2015).

Employees are able to successfully set up for BYOD, however progress is hindered when challenges are experienced during use. Where employees are unable to use BYOD, they do not experience the value associated with the benefits of BYOD use, as a result they find that they are negatively impacted. This has been attributed to a **lack of support** from the organisation to BYOD users. Employees are using different devices on different operating systems and the organisation's support team might not be equipped to handle the various issues experienced, or it might be that the employees simply are not aware of the support structures available at the organisation. The study has surfaced **device compatibility** concerns. These concerns could impact on work facilitation in that employee devices might not have the required specifications to perform the work required. Device compatibility could affect cost implications in that employees might want to purchase devices with better specifications, which could be more expensive in order to facilitate BYOD use.

BYOD vs Mobile Organisation Devices on employee

This study has found that employees are more inclined to prefer their personally owned devices to the organisation issued laptops. It has been mentioned that the organisation encourages the use of BYOD which could further motivate the employees. This section aims to compare BYOD and mobile organisation devices in terms of the impact on the employees.

The levels of **efficiency** have been appreciated more as a result of using BYOD as opposed to using the mobile organisation device. It appears that employees tend to be more focused and specific when using BYOD while they find that *"as soon as I log into my laptop I get distracted"*.

It is possible that without BYOD employees would be able to better manage their **work-life balance**. As it has been highlighted *“in the past...when you get home at six o'clock at night work would be second thought until tomorrow morning eight”*. This leads to the understanding that using the laptop would be the preferred device where work-life balance was the priority and was currently not manageable with BYOD.

As discussed in the ‘negative impacts on employee’ section, employees are having raised concerns relating to **cost implications** when using BYOD stating that *“if I use my own device the cost comes out of my pocket”*. This is not the case with the organisation’s device considering that *“the cost of and replacement cost of the device would be the organisation's cost”*. This is a significant impact on the employee and their decision to using BYOD. While cost incurred were raised as a negative impact it is suggested that the benefits of BYOD *“outweighs the cost”* of using BYOD.

6.3 Activity Theory as a lens for the study

The use of AT as a lens in the study assisted in addressing the research problem relating to the impact of BYOD use on employees. The components of the activity system; subject, tools, object, rules, community, and division of labour assisted in formulating the interview questions used to collect the data for this study. The use of these interview questions resulted in informative findings in relation to the research problem. The researcher was able to discuss and interpret the findings in a meaningful manner as AT helped focus on the purpose for BYOD as well as the interpretation of how each component affects how employees are impacted by BYOD use. AT in the context of the study was the most appropriate lens as it has assisted the researcher the in achieving the objectives of the study.

6.4 Summary

This section discussed the researcher’s interpretation of the findings from the study. The discussion was presented in relation to the positive and negative impacts of BYOD use on work facilitation as well as on the employees themselves. The relevance of these positive and negative impacts to BYOD in particular as opposed to mobile devices in general was also considered. The chapter is concluded with a discussion of Activity Theory as a lens applied for the study.

The following chapter concludes this research report, providing a summary, the contributions and limitations of the study as well as potential work for future studies.

7. SUMMARY AND CONCLUSION

7.1 Summary of study

There has been a shift in the use of technology in the workplace. Employees are found to be using personally owned device for the purpose of completing work-related activities. The use of personal devices in the workplace is known as Bring Your Own Device (BYOD) and has been a rising trend for more than a decade. Organisations know of the BYOD phenomenon and have taken measures to ensure that the adoption of it does not hinder the organisation in any way. Many studies have been conducted focusing on the impact of BYOD on organisations, however the studies that focus on the impact of BYOD on the employees was found to be minimal, specifically to the context of this study no literature has been found.

This study focused on addressing the gap in knowledge by exploring the impact that BYOD has on employees within the financial institution in South Africa, Gauteng province, through attempting to answer the below stated research questions:

- 1) What do employees of the financial institution use BYOD for?
- 2) What are the positive and negative impacts of BYOD for employees of the financial institution?

Eight interviews were conducted during the data collection phase of this research with additional data collected from documentation offered to the employees by the organisation. From the data collected 15 themes were defined and these were interpreted while addressing the research questions. The findings from the research questions were summarised as follows:

To address research question 1: Employees at the organisation use a wide range of devices for BYOD, with cell phones being the most used. While they own personal laptops, they do not use these for purposes of BYOD, this is attributed to the fact that the organisation does offer laptops to the employees. With BYOD employees were found to be performing different activities some specific to their roles at the organisation. The most common purpose of BYOD use appeared to be communication, for which the cell phone was frequently used.

While addressing research question 2, the findings were discussed from two perspectives. Firstly, to gain an understanding of the positive and negative impact of BYOD on the facilitation of work. Positive impacts were identified to be increased 'flexibility and mobility', better 'user experience, better 'employee interaction' and increased 'productivity'. The lack of 'organisational support' and the 'incompatibility of devices' appeared to be the negative impacts to work facilitation.

The overall impact of BYOD use on work facilitation could only be confirmed once there was an understanding of how different BYOD was to mobile devices issued by the organisation. It was found that the negative impacts, these being device compatibility issues and insufficient organisational support, would most likely not exist when organisation devices are used, however there is no confirmation that no negative impacts to work facilitation exist. It was also identified that flexibility and mobility is possible irrespective of whether a BYOD or organisation issued device (in this study, a laptop) is used. Better user experience, employee interaction and increased productivity were suggested to exist more in a BYOD environment than one in which organisation-issued mobile devices were used.

Employees were found to be both positively and negatively personally impacted by the use of BYOD. Positive impacts included; increased flexibility and mobility, increased efficiency, greater autonomy, and increased job satisfaction. The negative impacts on employees were identified to include; cost incurred, increased anxiety, and privacy and security concerns. The findings of this study show that the use of BYOD is favoured by employees and somewhat encouraged by organisations.

7.2 Relevance and Contribution

The research was conducted with the intention to contribute to the body of knowledge from two perspectives. These include a contribution to knowledge and a contribution to practice.

7.2.1 Contribution to knowledge

The study has contributed to the body of knowledge on BYOD use and impacts on employees. A few studies relating to the use of BYOD have been found, these studies have focused on exploring BYOD from the perspective of the organisation. No studies were found focusing on the impact of BYOD use in the context of a South African bank and this research provides insights into this context. Also, no studies were found to use AT as a lens in the context of this study, this study therefore provides a contribution to AT.

The study also contributed to knowledge on the use of AT in IS studies, in particular on use of AT in BYOD studies. With the components of AT the researcher was able to surface and discuss factors that influence the impact of BYOD use on employees.

7.2.2 Contribution to practitioners

This study has surfaced the impact of BYOD directly on the employees, which needs to be considered by the organisation to ensure that employees are kept motivated and encouraged. Employees, particularly those working at the financial institution at which this study was done, could use this study to learn about the positive and negative impacts of BYOD before making the decision to use BYOD.

The findings of this study could also equip the relevant decision makers in the organisation with the knowledge relating to the impacts of using BYOD, which in turn could assist in making more informed decisions about BYOD facilitation in the organisation. Although the results of this case study cannot be generalised, other organisations considering the facilitation of BYOD use could learn about possible advantages and stumbling blocks from this study.

7.3 Limitations of study

Limitations are matters and occurrences that the researcher experiences but are not within their control. In some instances, these results affect the findings and conclusion drawn from the study. The researcher was solely involved in the collection, analysis and interpretation of the data; for this reason it is possible that the researcher's understanding and opinion of the study could have influenced the documented results. Also, the study assumes that participants responded to the research questions to the best of their ability. However, each response is based on the participant's experience, knowledge and opinion; that data collected could therefore be biased on the part of the participants.

7.4 Future work

AT involves all components of the activity system when exploring a phenomenon. As this phenomenon is not widely explored in the context of this study, applying a different framework, with different components, could provide insight into other impacts of BYOD use on employees not exposed in this study.

Secondly, the findings suggest that employees experience positive and negative impacts of BYOD use. These findings were the focus of the study and the management of these impacts within the workplace were not explored. Research concentrating on how organisations could assist manage the negative impacts, more specifically the negative impacts, of BYOD use on employees is recommended.

The focus of this case study was to conduct an in-depth exploration of the impact of BYOD use on employees, in one South African bank and with eight participants interviewed. The findings, in this context, revealed the impact of BYOD use on employees. These findings cannot be generalised; therefore, a study focusing on a broader population sample could provide a more global view of the impact of BYOD use on employees. As the participants of this study were all IT staff it could be beneficial to explore the impact of BYOD on employees in other departments, such as HR and Finance.

Lastly, the participants were able to articulate how they felt they were impacted by BYOD use, however, many of them have been using BYOD for less than 4 years, a study focusing on employees with a longer period of experience in BYOD use could have more to share.

7.5 Conclusion

This study aimed at understanding the impact of BYOD use on employees within a bank in South Africa, specifically in the Gauteng province. Using an exploratory qualitative approach, the research facilitated an understanding of the impact of BYOD. Since BYOD is not widely studied, more so in the context of this current study the researcher was guided by existing literature and not by a theory. The data was collected from eight participants during semi-structured interviews. It was also noted from literature that BYOD use is growing within organisations and the bank is no exception.

Although not intended, all the study participants were IT employees. As a result, the impact of BYOD use in the findings of this study is from the perspective of IT employees. It should be noted, however, that the work activities performed using BYOD are the same for IT employees and non-IT employees. As such, it is possible that the perspectives discovered in this study do reflect the perspectives of non-IT employees.

While some of the participants only had a few years using BYOD, their perspective of the phenomenon in the context of their work came across clearly. The use of BYOD for work-related activities seems to impact how employees facilitate work. The study has suggested that the impact is both positive and negative. It was also noted that some of the impacts identified in this study were as a result of mobile devices and not solely a result of BYOD use.

With the use of Activity Theory as the lens of the study it was found that there are more positive impacts of BYOD use on employees as opposed to negative impacts. Though not addressed by this study, employees using BYOD in sectors other than banking would likely experience a similar relationship between positive and negative impacts of BYOD. BYOD as a phenomenon is finding space in the banking sector and it appears to be growing more popular, and this may certainly be the case in other sectors as well.

REFERENCES

- Abbas, S. K., Hassan, H. A., Asif, J., Ahmed, B., Hassan, F. and Haider, S. S. (2018). Integration of TTF, UTAUTand ITM for mobile Banking Adoption. *International Journal of Advanced Engineering, Management and Science*, 4(5), 375–379.
- Adedolapo, A.-A. and Kabanda, S. (2016). Bring Your Own Device (BYOD) Adoption in South African SMEs. Doctoral Dissertation, University of Cape Town, 118.
- Afreen, R., 2014. Bring your own device (BYOD) in higher education: opportunities and challenges. *International Journal of Emerging Trends and Technology in Computer Science*, 3(1), 233-236.
- AICPA. (2012). 2012 Top Technology Initiatives Survey Results.
- Aiken, M., Gu, L. and Wang, J., 2013. Task knowledge and task-technology fit in a virtual team. *International Journal of Management*, 30(1), pp.3-12.
- Alavi, H.R., Askaripur, M.R. (2003). The relationship between self-esteem and job satisfaction of personnel in government organisations. *Public Personnel Management*, 32(4), 591-600
- Amry, A., 2018. The Effect of Twitter Activities in a Blended Learning Classroom Guided by Activity Theory on Students' Achievement and Attitudes. *Turkish Online Journal of Educational Technology-TOJET*, 17(2), pp.143-157.
- Anon. (2017). Qwerty Digital. The Digital Landscape in South Africa 2017, 1–22. [Online] Available at: <http://www.qwertydigital.co.za> [Accessed: 6 October 2019]
- Arora, K., 2015. Research methods: The essential knowledge base. *Nelson Education*.
- Atieno, O.P., 2009. An analysis of the strengths and limitation of qualitative and quantitative research paradigms. *Problems of Education in the 21st Century*, 13(1), pp.13-38.
- Baguma, R., Bagarukayo, E., Namubiru, P., Brown, C. and Mayisela, T., 2019. Using WhatsApp in Teaching to Develop Higher Order Thinking Skills--A Literature Review Using the Activity Theory Lens. *International Journal of Education afnd Development using Information and Communication Technology*, 15(2), pp.98-116.
- Bai, Y., Han, G.H. and Harms, P.D., 2016. Team conflict mediates the effects of organisational politics on employee performance: A cross-level analysis in China. *Journal of Business Ethics*, 139(1), 95-109.
- Barab, S., Barnett, M., Yamagata-Lynch, L., Squire, K. and Keating, T. (2002). Pursuing an Evolving Object: A Case Study in Object Formation and Identification. *Mind, Cultureand Activity*, 9(2), 76–107.
- Barmapsalou, K., Cruz, T., Monteiro, E. and Simoes, P., 2018. Current and future trends in mobile device forensics: A survey. *ACM Computing Surveys (CSUR)*, 51(3), 46.

- Bashir, M., Afzal, M. T. and Azeem, M. (2008). Reliability and Validity of Qualitative and Operational Research Paradigm. *Pakistan Journal of Statistics and Operation Research*, 4(1), 35–45.
- Baskerville, R. and Pries-Heje, J., 2010. Explanatory design theory. *Business & Information Systems Engineering*, 2(5), pp.271-282
- Berl, A. and De Meer, H. (2011). Integrating mobile cellular devices into popular peer-to-peer systems. *Telecommunication Systems*, 48(1–2), 173–184.
- Bhattacharjee, A. (2012). Social Science Research: Principles, Methods and Practices. In University of South Florida.
- Bødker, S. (1991). Activity theory as a challenge to systems design. *DAIMI Report Series*, 19(334).
- Braun, V. and Clarke, V., 2006. Using thematic analysis in psychology. *Qualitative research in psychology*, 3(2), pp.77-101.
- Brodin, M., 2016. BYOD vs. CYOD: What is the difference?. In *9th IADIS International Conference Information Systems*, 9-11 April 2016, Vilamoura, Portugal (pp. 55-62). IADIS Press.
- Business Tech. 2019. Battle of the banks: South Africa's big 5 banks compared. [Online] Available at: <https://businesstech.co.za/news/banking/339319/battle-of-the-banks-south-africas-big-5-banks-compared/> [Accessed 13 September 2019]
- Callies, K.R., Noteboom, C.B., Talley, D. and Wang, Y., 2019. Employee Acceptance of Employer Control Over Personal Devices. *Twenty-fifth Americas Conference on Information Systems*
- Calvard, T., 2019. Integrating Social Scientific Perspectives on the Quantified Employee Self. *Social Sciences*, 8(9), p.262.
- Cassell, C. and Symon, G. eds., 2004. Essential guide to qualitative methods in organisational research. *Sage publications*.
- Chang, J.M., Ho, P.C. and Chang, T.C., 2014. Securing BYOD. *IT Professional*, 16(5), pp.9-11.
- Chaturvedi, A., Dhingra, J. and Kaur, S., Impact of digitization on banking sector. *Digitization*. 2018,.156-160
- Cochrane, T., Narayan, V. and Oldfield, J. (2014). Emerging technologies in New Zealand: A pedagogical framework for mobile social media. In *Activity Theory, Authentic Learning and Emerging Technologies: Towards a Transformative Higher Education Pedagogy*, 126–143.
- Corral, L., Janes, A. and Remencius, T., 2012. Potential advantages and disadvantages of multiplatform development frameworks—A vision on mobile environments. *Procedia Computer Science*, 10, pp.1202-1207
- Davis, F. (1986). A technology acceptance model for empirically testing new end-user information systems. *Cambridge, MA*.
- Davis, F.D. and Venkatesh, V., 1996. A critical assessment of potential measurement biases in the

- technology acceptance model: three experiments. *International journal of human-computer studies*, 45(1), 19-45.
- De Silva, M.D., 2016. Financial Intermediation Development and Economic Growth Nexus in Sri Lanka. *Staff Studies*, 46(1-2).
- Dishaw, M.T. and Strong, D.M., 1999. Extending the technology acceptance model with task–technology fit constructs. *Information and management*, 36(1), 9-21.
- Disterer, G. and Kleiner, C. (2013). BYOD Bring Your Own Device. *Procedia Technology*, 9, 43–53.
- Doargajudhur, M.S. and Dell, P., 2018. The Effect of Bring Your Own Device (BYOD) Adoption on Work Performance and Motivation. *Journal of Computer Information Systems*, pp.1-12.
- Downer, K. and Bhattacharya, M., 2015, December. BYOD security: A new business challenge. In *2015 IEEE International Conference on Smart City/SocialCom/SustainCom (SmartCity)* (pp. 1128-1133). IEEE.
- Ellis, L., Saret, J. and Weed, P. (2012). BYOD: From company-issued to employeeowned devices. *Telecom, Media and High Extranet*, McKinsey and Company, (20), 31-38.
- Engeström, Y. (1987). Learning by expanding: An activity-theoretical approach to developmental research. Helsinki: Orienta-Konsultit.
- Engeström, Y., & Miettinen, R. (1999). Activity Theory and individual and social transformation. In Y. Engeström, R. Miettinen, & R. L. Punamäki (Eds.), *Perspectives on Activity Theory* (pp. 19-38). Cambridge: Cambridge University Press.
- Engineer IT. 2018. BYOD and SYOD are not dead. [Online] Available at: <https://www.engineerit.co.za/engineerit/byod-and-syod-are-not-dead/> [Accessed 13 September 2019]
- Er, M., and Kay, R., (2005) Mobile technology adoption for mobile information systems: an activity theory perspective. *IEEE*.
- Eslahi, M., Naseri, M. V., Hashim, H., Tahir, N. M., Hisham, E. and Saad, M. (2014). BYOD: Current state and security challenges. *IEEE Symposium on Computer Applications and Industrial Electronics (ISCAIE)*, 189-192).
- Etikan, I., Musa, S. and Alkassim, R. (2016). A comparison of convenience sampling and purposive sampling. *Journal of Nursing*, 5(1–4), 105–111.
- Evans, D., 2013. What is BYOD and why is it important. *Computing*, August, 23.
- Farrell, D., 2014. The Factors That Influence the Implementation of a BYOD Program.
- Fin24. 2015. Customers slightly happier with SA banks – index. [Online] Available at: <https://www.fin24.com/Companies/Financial-Services/Customers-slightly-happier-with-SA-banks-index-20150302> [Accessed: 13 September 2019]

- Foot, K.A., 2014. Cultural-historical activity theory: Exploring a theory to inform practice and research. *Journal of Human Behavior in the Social Environment*, 24(3), pp.329-347.
- French, A. M., Guo, C. J. and Shim, J. P. (2014). Current status, issues and future of bring your own device (BYOD). *Communications of the Association for Information Systems*, 35(November), 191–197.
- Friedman, J. and Hoffman, D.V. “Protecting data on mobile devices: A taxonomy of security threats to mobile computing and review of applicable defenses,” *Information-Knowledge-Systems Management* (7:1,2), 2008, 159-180.
- Fuller, R.M. and Dennis, A.R., 2009. Does fit matter? The impact of task-technology fit and appropriation on team performance in repeated tasks. *Information Systems Research*, 20(1), pp.2-17.
- Gewald, H., Wang, X., Weeger, A., Raisinghani, M.S., Grant, G., Sanchez, O.P. and Pittayachawan, S., 2017. Millennials' attitudes toward IT consumerization in the workplace. *Communications of the ACM*, 60 (10), 62
- Ginovsky, J., 2012. " BYOD" quandary. *American Bankers Association. ABA Banking Journal*, 104(4), p.24.
- Gono, A.R., 2019. Mitigating security implications of bringing your own device in an enterprise environment (Doctoral dissertation, Strathmore University).
- Goodhue, D. L. and Thompson, R. L. (1995). Task-Technology Fit and Individual Performance. *MIS Quarterly*, 19(2), 213.
- Government Technology. (2014). CIOs SOUND OFF ON BYOD.
- Gregory, R.W., Kaganer, E., Henfridsson, O. and Ruch, T.J., 2018. IT Consumerization and the Transformation of IT Governance. *MIS Quarterly*, 42(4), 1225-1253.
- Gretschel, P., Ramugondo, E. L. and Galvaan, R. (2015). An introduction to Cultural Historical Activity Theory as a theoretical lens for understanding how occupational therapists design interventions for persons living in low-income conditions in South Africa. *South African Journal of Occupational Therapy*, 45(1).
- Gupta, R., Bhardwaj, G. and Singh, G., 2019, April. Employee Perception and Behavioral Intention to Adopt BYOD in the Organizations. In *2019 International Conference on Automation, Computational and Technology Management (ICACTM)* (pp. 73-78). IEEE.
- Gustav, A. and Kabanda, S., 2016. BYOD adoption concerns in the South African financial institution sector. In *CONF-IRM*(p. 59).
- Hasan, H. & Kazlauskas, A. (2014). Activity Theory: who is doing what, why and how. In H. Hasan (Eds.), *Being Practical with Theory: A Window into Business Research* (pp. 9-14). Wollongong, Australia:

THEORI.

- Hasan, H. and Kazlauskas, A. (2014). Activity Theory: who is doing what, why and how, 9–14.
- Hasan. (2016). Positivism: to what extent does it aid our understanding of the contemporary social world? *Quality and Quantity*, 50(1), 317–325.
- Hashim, N. H. and Jones, M. L. (2007). Activity theory: a framework for qualitative analysis. *International Qualitative Research Convention*, (September), 3–5.
- Haswell, P., 2014. BYOD – All it's cracked up to be. Computerworld Hong Kong.
- Hillard, T. (2017). The Rise of the mobile devices: Putting benefit communication in your participants' hands. *In Benefits Magazine* (Vol. 54).
- Hills, J. and Gibson, C., 1992. A conceptual framework for thinking about conceptual frameworks: Bridging the theory-practice gap. *Journal of Educational Administration*, 30(4).
- Hsieh, H.-F. and Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research*, 15(9), 1277–1288. <http://eurekaconnection.files.wordpress.com/2014/02/p-09-14-activity-theory-theori-ebook2014.pdf>
- <https://www.computerweekly.com/news/2240170814/BYOD-devices-to-double-by-2014> [Accessed 31 September 2020]
- Iyamu, T. and Nggame, Y. (2017). Towards a conceptual framework for protection of personal information from the perspective of activity theory. *SA Journal of Information Management*, 19(1), 1–8.
- Jentoft, N. and Olsen, T.S., 2019. Against the flow in data collection: How data triangulation combined with a 'slow' interview technique enriches data. *Qualitative Social Work*, 18(2), pp.179-193.
- Jeong, M., Lee, M. and Nagesvaran, B., 2016. Employees' use of mobile devices and their perceived outcomes in the workplace: A case of luxury hotel. *International Journal of Hospitality Management*, 57, 40-51.
- Jonassen, D.H. and Rohrer-Murphy, L., 1999. Activity theory as a framework for designing constructivist learning environments. *Educational technology research and development*, 47(1), 61-79.
- Junglas, I., Goel, L., Ives, B. and Harris, J. (2019). Innovation at work: The relative advantage of using consumer IT in the workplace. *Information Systems Journal*, 29(2), 317–339.
- Kabanda, S. and Brown, I., 2014. Bring-your-own-device (BYOD) practices in SMEs in developing countries—the case of Tanzania. *ACIS*.
- Kaenampornpan, M. and O'Neill, E., 2004. Modelling context: an activity theory approach. *In European Symposium on Ambient Intelligence*, 367-374
- Kalra, A. and Jain, R., 2018. Customer satisfaction and usage of digital banking. *Digitization*. 2018., 29-

- Kaptelinin, V., Kuutti, K. and Bannon, L. (1995). Activity theory: Basic concepts and applications. *International Conference on Human-Computer Interaction*, 189–201.
- Karanasios, S., 2018. Toward a unified view of technology and activity: The contribution of activity theory to information systems research. *Information Technology and People*, 31(1), 134-155.
- Karanasios, S., Allen, D.K. and Finnegan, P., 2018. Activity theory in Information Systems Research. *Inf. Syst. J.*, 28(3), pp.439-441.
- Kelley, K., Clark, B., Brown, V. and Sitzia, J. (2003). Good practice in the conduct and reporting of survey research. *International Journal for Quality in Health Care*, 15(3), 261–266.
- Kleiner, C. and Disterer, G., 2015. Ensuring mobile device security and compliance at the workplace. *Procedia Computer Science*, 64, pp.274-281.
- Klenke, K., 2016. Qualitative research in the study of leadership. Emerald Group Publishing Limited.
- Koesyairy, A.A., Kurniawan, A., Hidayanto, A.N., Budi, N.F.A. and Samik-Ibrahim, R.M., 2019, April. Mapping Internal Control of Data Security Issues of BYOD Program in Indonesian Banking Sector. *In 2019 5th International Conference on Computing Engineering and Design (ICCED)* (pp. 1-5). IEEE.
- Koole, M. L. Mobile Learning - A model for framing mobile learning. *Mobile learning: Transforming the delivery of education and training*, 1(2), pp.25-47.
- Krefting, L. (1991). Rigour in qualitative research: The assessment of trustworthiness.
- Kuutti, K. (1991). The concept of activity as a basic unit of analysis for CSCW research. *Proceedings of the Second European Conference on Computer-Supported Cooperative Work ECSCW '91*, 25(26), 249–264.
- Kuutti, K. (1995). Activity Theory as a potential framework for human- computer interaction research. *In Cambridge: MIT Press* (pp. 17–44).
- Kuutti, K., 1996. Activity theory as a potential framework for human-computer interaction research. Context and consciousness: *Activity theory and human-computer interaction*, 1744.
- Lacey, A. and Luff, D., 2009. Qualitative data analysis: the NIHR research design service for Yorkshire and the Humber. *National Institute for Health Research*
- Lebek, B., Degirmenci, K. and Breitner, M.H., 2013. Investigating the influence of security, privacy, and legal concerns on employees' intention to use BYOD mobile devices. *19th Americas Conference on Information Systems (AMCIS 2013)*, 15-17 August 2013
- Leclercq-Vandelannoitte, A., 2015. Managing BYOD: how do organisations incorporate user-driven IT innovations? *Information Technology & People*.
- Lee, J., Warkentin, M., Crossler, R. E. and Otondo, R. F. (2017). Implications of monitoring mechanisms

- on bring your own device adoption. *Journal of Computer Information Systems*, 57(4), 309–318.
- Liaw, S. S., Hatala, M. and Huang, H. M. (2010). Investigating acceptance toward mobile learning to assist individual knowledge management: Based on activity theory approach. *Computers and Education*, 54(2), 446–454.
- Longhurst, R., 2003. Semi-structured interviews and focus groups. *Key methods in geography*, 3(2), pp.143-156.
- Lu, M. H., Lin, W. and Yueh, H. P. (2018). How Do Employees in Different Job Roles in the Insurance Industry Use Mobile Technology Differently at Work? *IEEE Transactions on Professional Communication*, 61(2), 151–165.
- Luna-Reyes, L.F. and Gil-Garcia, J.R., 2014. Digital government transformation and internet portals: The co-evolution of technology, organizations, and institutions. *Government information quarterly*, 31(4), pp.545-555.
- Luttenegger, J.M., 2010. Smartphones: Increasing productivity, creating overtime liability. *J. Corp. L.*, 36, p.259.
- Magruder, J. S., Lewis, S. X., Burks, E. J. and Smolinski, C. (2015). Bring Your Own Device (BYOD)-Who Is Running Organisations? *Journal of Accounting and Finance*, 15(1), 55–61.
- Mahindru, R. (2013). Bring Your Own Device (BYOD): An Empirical Study Across Industries. *International Journal Of Research In Commerce and Management*, 4(12), 131–137.
- McCarthy, R.V. and Claffey, G.F., 2005. Task-technology fit in data warehousing environments: analyzing the factors that affect utilization. *Journal of International Technology and Information Management*, 14(4), p.4.
- Melitz, M.J., 2003. The impact of trade on intra-industry reallocations and aggregate industry productivity. *econometrica*, 71(6), 1695-1725.
- Miller, S.A., 2017. Developmental research methods. *Sage publications*.
- Miller, T., Birch, M., Mauthner, M. and Jessop, J. eds., 2012. Ethics in qualitative research. *Sage publications*.
- Mitrovic, Z., Veljkovic, I., Whyte, G. and Thompson, K., 2014, November. Introducing BYOD in an organisation: The risk and customer services viewpoints. *In The 1st Namibia Customer Service Awards and Conference* (1-26)
- Mohamed, R., Ngui, T. K., and Mulili, B., 2017. Factors Determining Employee Retention in the Banking Sector: A Case Study of Agricultural Bank of Sudan. *Journal of Educational and Entrepreneurship*, 4(10) pp.1-23.
- Morse, J. M., Barrett, M., Mayan, M., Olson, K. and Spiers, J. (2002). Verification Strategies for Establishing Reliability and Validity in Qualitative Research. *International Journal of Qualitative*

- Methods*, 1(2), 13–22.
- Mukhopadhyay, S. and Gupta, R. K. (2014). Survey of Qualitative Research Methodology in Strategy Research and Implication for Indian Researchers. *Vision: The Journal of Business Perspective*, 18(2), 109–123.
- Murphy, E. and Rodriguez-Manzanares, M.A., 2008. Using activity theory and its principle of contradictions to guide research in educational technology. *Australasian Journal of Educational Technology*, 24(4), pp.442-457.
- Mursu, Á., Luukkonen, I., Toivanen, M. and Korpela, M., 2007. Activity Theory in Information Systems Research and Practice: Theoretical Underpinnings for an Information Systems Development Model. *Information Research: an international electronic journal*, 12(3), 3.
- Musarurwa, A., Flowerday, S. and Cilliers, L., 2019. The bring-your-own-device unintended administrator: A perspective from Zimbabwe. *The Electronic Journal of Information Systems in Developing Countries*, 85(4), p.e12076.
- Mushi, R. (2018). The Moderating Effect of Mandatoriness on the Acceptance of Mobile Phone Technology: SMEs Perspective. *International Journal of Wireless and Microwave Technologies*, 8(5), 46–59.
- Nardi, B. A. (1996). A comparison of Activity Theory, Situated Action Models and Distributed Cognition. *Proceedings East-West Conference on Human-Computer Interaction.*, 352–359.
- Nathan Eddy. 2013. Businesses Must Adapt to Permanent BYOD Presence: Ovum. [ONLINE] Available at: <http://www.eweek.com/small-business/businesses-must-adapt-to-permanent-byod-presence-ovum> [Accessed 2 November 2018].
- Niehaves, B., Koeffer, S., Ortbach, K. and Stefan, K. (2012). Towards an IT Consumerization Theory—A Theory and Practice Review. Working Papers, ERCIS - *European Research Center for Information Systems*, (13), 1–34.
- Oates. (2006). Research Information Systems and Computing (pp. 200–290). 200–290.
- OBISI, C. and Gbadamosi, A.A.O., Impact of Mobile Applications on Workforce Productivity in Road Transport Industry in Nigeria. *BVIMSR's Journal of Management Research*. 9 (2)
- Ogie, R., 2016. Bring your own device: an overview of risk assessment. *IEEE Consumer Electronics Magazine*, 5(1), pp.114-119.
- Ortbach, K., 2015, May. Unraveling the Effect of Personal Innovativeness on Bring-Your-Own-Device (BYOD) Intention-The Role of Perceptions Towards Enterprise-Provided and Privately-Owned Technologies. *In ECIS*.
- Ostermann, U. and Wiewiorra, L., 2016. Bring it On (e)! Personal Preferences and Traits as Influencing Factors to Participate in BYOD Programs.

- Ostermann, U., Wiewiorra, L. and Franzmann, D., 2017. One of two or two for one?-Analyzing employees' decisions to dual use devices.
- Oye, N.D., Iahad, N.A. and Rahim, N.A., 2014. The history of UTAUT model and its impact on ICT acceptance and usage by academicians. *Education and Information Technologies*, 19(1), pp.251-270.
- Park, C., 2019. Exploring a New Determinant of Task Technology Fit: Content Characteristics. *Journal of International Technology and Information Management*, 27(3), pp.100-118.
- Parsons, T. and Kroeber, A.L., 1958. The concepts of Culture and of Social System. *American Sociological Review*, 23(5), pp.582-583.
- Patton, M.Q., 1990. Qualitative evaluation and research methods. *SAGE Publications*.
- Peiro, J.M., Agut, S., Grau, R., 2010. The relationship between overeducation and job satisfaction among young Spanish workers. *Journal of applied Social Psychology*, 40(3), 666-689.
- Peretti, K., Sarkisian, B., 2014. Peering into Personal Space: Investigating Employee- owned Mobile Devices. *Journal of Internet Law*, 17(10), 3-6.
- Punch, K.F., 2005. Introduction to Social Research: Quantitative and Qualitative Approaches. *Sage Publications*.
- Putri, F.F. and Hovav, A., 2014. Employees compliance with BYOD security policy: Insights from reactance, organisational justice, and protection motivation theory.
- Rauniar, R., Rawski, G., Yang, J. and Johnson, B., 2014. Technology acceptance model (TAM) and social media usage: an empirical study on Facebook. *Journal of Enterprise Information Management*, 27(1), 6-30.
- Recker, J., 2012. Scientific research in information systems: a beginner's guide. *Springer Science and Business Media*.
- Sandelowski, M., 2000. Whatever happened to qualitative description?. *Research in nursing & health*, 23(4), pp.334-340
- Saunders, M., Lewis, P. and Thornhill, A. (2009). Research methods for business students. In *International Journal of the History of Sport* (Vol. 30).
- Scarfo, A., 2012, November. New security perspectives around BYOD. In *2012 Seventh International Conference on Broadband, Wireless Computing, Communication and Applications* (pp. 446-451). IEEE.
- Schalow, Paul R.; Winkler, Till J.; Repschlaeger, Jonas; and Zarnekow, Ruediger, (2013). "The Blurring Boundaries of Work-Related and Personal Media Use: A Grounded Theory Study on The Employee's Perspective".
- Scott, J. 2012. BYOD devices to double by 2014. [Online] Available at:

- Shachaf, P., 2008. Cultural diversity and information and communication technology impacts on global virtual teams: An exploratory study. *Information & Management*, 45(2), pp.131-142.
- Siddique, H.M.A., Usman, S. and Ishaq, J., 2018. Financial Development and Economic Growth: The Role of Energy Consumption. *Journal of Quantitative Methods* Volume, 2, 2
- Sinclair, M., 2007. A guide to understanding theoretical and conceptual frameworks. *Evidence-Based Midwifery*, 5(2), pp.39-40.
- Sinclair, M., 2007. A guide to understanding theoretical and conceptual frameworks. *Evidence-Based Midwifery*, 5(2), pp.39-40.
- Singh, N. (2012). B.Y.O.D. Genie Is Out Of the Bottle – “Devil Or Angel.” *Journal of Business Management and Social Sciences Research*, 1(3), 1–12.
- Smith, W.P., 2017. Can we borrow your phone? Employee privacy in the BYOD era. *Journal of Information, Communication and Ethics in Society*, 15(4), pp.397-411.
- Stephen Cooper. 2018. The Ultimate Guide to BYOD in 2018. [ONLINE] Available at: <https://www.comparitech.com/net-admin/ultimate-guide-to-byod/>. [Accessed 2 November 2018]
- Sujan, M.A., Rizzo, A. and Pasquini, A., 2002, March. Contradictions and critical issues during system evolution. In *Proceedings of the 2002 ACM symposium on Applied computing* (pp. 711-715). ACM.
- Swoyer, S., 2012. IDC Forecasts Strong Growth in Mobile Workforce. [Online] Available at: <https://esj.com/articles/2012/01/23/mobile-workforce-growth.aspx>
- TelecomTiger, 2014. Smartphones are driving BYOD growth in APAC: IDC: IDC expects the Asia/Pacific Bring Your Own Device market to continue strong growth in 2014 and into 2015 as consumer smartphone and tablet continue gain market across the region. *New Delhi*.
- Tewari, A., Nagdev, P. and Israni, K., 2015. BYOD: usability. *International Journal of Computer Science and Information Technologies (IJCSIT)*, 6, pp.20810-2814.
- Toktarova, V. (2016). Mobile Technologies Within Contextual Learning. *Proceedings of ADVED 2016 2nd International Conference on Advances in Education and Social Sciences*, (October), 485–488.
- Trifonova, A. and Ronchetti, M., 2003. Where is mobile learning going?. In *E-Learn: World Conference on E-Learning in Corporate, Government, Healthcare and Higher Education* (pp. 1794-1801). *Association for the Advancement of Computing in Education (AACE)*.
- Tse, D., Wang, L. and Li, Y., 2016, August. Mobility Management for Enterprises in BYOD Deployment. In *2016 IEEE Trustcom/BigDataSE/ISPA* (pp. 638-645). IEEE.
- Twinomurinzi, H. and Mawela, T., 2014, September. Employee perceptions of BYOD in South Africa: Employers are turning a blind eye?. In *Proceedings of the Southern African Institute for Computer*

- Scientist and Information Technologists Annual Conference 2014 on SAICSIT 2014 Empowered by Technology* (pp126). ACM.
- Uden, L., 2007. Activity theory for designing mobile learning. *IJMLO*, 1(1), pp.81-102.
- Walliman, N. (2011). Research Methods: The Basics. *In Research Methods: The Basics*.
- Walsham, G., 1995. Interpretive case studies in IS research: nature and method. *European Journal of information systems*, 4(2), pp.74-81.
- Waterfill, M.R. and Dilworth, C.A., 2014. BYOD: Where the Employee and the Enterprise Intersect. *Employee Relations Law Journal*, 40(2), pp. 26-36.
- Weber. (2004). The Rhetoric of Positivism Versus Interpretivism: A Personal View. *MIS Quarterly*, 28(1), iii–xii.
- Weeger, A., Wang, X. and Gewald, H. (2015). It Consumerization: Byod –Program Acceptance and Its Impact on Employer Attractiveness. *Journal of Computer Information Systems*, 56(1), 1–10.
- Weidman, J. and Grossklags, J. (2017). I Like It, but I Hate It: Employee Perceptions Towards an Institutional Transition to BYOD Second-Factor Authentication. *Annual Computer Security Applications Conference (ACSAC)*, 212–224.
- Williams, M. and Moser, T., 2019. The art of coding and thematic exploration in qualitative research. *International Management Review*, 15(1), pp.45-55.
- Wilson, C., 2014. Interview Techniques for UX Practitioners: A User-Centered Design Method. *MK Publications*.
- Wilson, V., 2014. Research methods: triangulation. Evidence based library and information practice, 9(1), pp.74-75.
- Wu, C., Kao, S.C. and Shih, C.H., 2018. Task-technology fit in knowledge creation: the moderating role of cognitive style. *VINE Journal of Information and Knowledge Management Systems*, 48(1), 83-102.
- Yamin, M.M. and Katt, B., 2019, January. Mobile device management (MDM) technologies, issues and challenges. *In Proceedings of the 3rd International Conference on Cryptography, Security and Privacy* (pp. 143-147).
- Yin, C., Liu, L. and Liu, L. (2014). Byod Implementation: Understanding Organisational Performance Through a Gift Perspective. *Pacific Asia Conference on Information Systems*, 129.
- Yin, R.K., 2003. Case Study Research: Design and Methods. *Sage publications*.
- Zeleny, M., 2007. The mobile society: effects of global sourcing and network organisation. *International Journal of Mobile Learning and Organisation*, 1(1), pp.30-40.
- Zigurs, I. and Buckland, B.K., 1998. A theory of task/technology fit and group support systems effectiveness. *MIS quarterly*, 22(3).

Appendix A: Ethics Documentation

A1: Consent form for organisation (Permission Letter to Collect Data)



Consent Form for Organisations (SCFO)

Company Name: [REDACTED]

Date: 18 June 2019

We hereby support Ms. Sanda Songca's application, a Masters by Coursework student from the University of the Witwatersrand, to conduct interviews with our staff members between the period of July 2019 and September 2019 inclusive.

The research of the Candidate's Masters dissertation will be based on the research title: "The impact of the use of BYOD on Employees: The Case of a South African Bank"

The research aims to address the below research questions:

1. What do employees of the financial institution use BYOD for?
2. What are the positive and negative impacts of BYOD for employees of the financial institution?

I agree that data collected for the purpose of the research will be used in the dissertation. The research report will not label or make mention of the Bank's information deemed by the Bank to be confidential, the Bank's intellectual property, the Bank's name or mark. In this manner, the student will be adhering to confidentiality of the bank's policies.

Permission is granted to Ms. Sanda Songca subject to her obtaining ethical clearance to conduct research from the Ethics Committee of the University of the Witwatersrand, Johannesburg and by abiding to its terms.

I have been informed of Ms. Sanda Songca's line of research and of the nature of the intervention.

Name: Fustin Kivedo 20/06/2019.

Signature: 

A2: Participant Consent Form



Title of project: The impact of the use of BYOD on Employees: The Case of a South African Bank?

Name of researcher: Sanda Songca

I agree to participate in this research project. The research has been explained to me and I understand what my participation will involve.

I agree that my participation will remain anonymous YES NO (please circle)

I agree that the researcher may use anonymous quotes in his/her research report YES NO

I agree that the interview may be audio recorded YES NO

I agree that the information I provide may be used anonymously by other researchers following this study YES NO

..... (signature)

..... (name of participant)

..... (date)

A3: Participant Information Sheet



Dear Sir/Madam

My name is Sanda Songca and I am a Masters student in Information Systems at Wits University in Johannesburg. As part of my studies I have to undertake a research project. The aim of this research project is to explore the impact of BYOD on employees in the bank.

As part of this project I would like to invite you to take part in an interview. This activity will involve a once off interview where you will be answering a set of questions and it will take around 60 minutes. With your permission, I would also like to record the interview using an audio device. The audio recording will be uploaded onto a password protected computer to ensure safeguarding.

You will not receive any direct benefits from participating in this study, and there are no disadvantages or penalties for not participating. You may withdraw at any time or not answer any question if you do not want to. The interview will be completely confidential and anonymous, and the information you give to me will be held securely and not disclosed to anyone else. I will be using a pseudonym (false name) to represent your participation, in my final research report. If you experience any distress or discomfort, we will stop the interview or resume another time.

If you have any questions afterwards about this research, feel free to contact me on the details listed below. If you wish to receive a summary of this report, I will be happy to send it to you upon request (optional). If you have any queries, concerns or complaints regarding the ethical procedures of this study, you are welcome to contact the University Human Research Ethics Committee (non-medical), telephone + 27(0)11 717 1408, email Shaun.Schoeman@wits.ac.za

Yours sincerely,

Sanda Songca, 0613929h@students.wits.ac.za, 0734171167

Lyrice Cohen, Lyrice.Cohen@wits.ac.za, 011-7178153

A4: Final Ethics Clearance Certificate



SCHOOL OF ECONOMICS AND BUSINESS SCIENCES ETHICS COMMITTEE
CONSTITUTED UNDER THE UNIVERSITY HUMAN RESEARCH ETHICS COMMITTEE (NON-MEDICAL)

CLEARANCE CERTIFICATE

PROTOCOL NUMBER: CBUSE/1477

PROJECT TITLE

The impact of the use of BYOD on Employees: The Case of a South African Bank

INVESTIGATOR

Ms. Sanda Songca

SCHOOL/DEPARTMENT OF INVESTIGATOR

School of Economic and Business Sciences

DATE CONSIDERED

17 June 2019

DECISION OF THE COMMITTEE

Approved unconditionally

EXPIRY DATE

31 October 2019

ISSUE DATE OF CERTIFICATE

22 July 2019

ACTING CHAIRPERSON

(Dr Suvera Boodhoo)

A handwritten signature in black ink, appearing to read 'Suvera Boodhoo', written over a horizontal line.

cc: Supervisor: Dr. Lyrice Cohen

DECLARATION OF INVESTIGATOR

To be completed in duplicate and **ONE COPY** returned to the Chairperson of the School/Department ethics committee.

I fully understand the conditions under which I am authorized to carry out the abovementioned research and I guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee.

A handwritten signature in black ink, appearing to read 'Sanda Songca', written over a horizontal line.
Signature

Date

26/07/2019

Appendix B: Interview Documentation

B1: Interview Protocol

Table 10: Interview Protocol

Interview Information					
Interviewer:					
Date:					
Venue:					
Duration:			Start:	End:	
Demographics					
1	Full Name (Optional)				
2	Job Title:				
3	Do you work at the financial organisation?		☐ Yes	☐ No	
4	How long have you been with the organisation?				
	Less than 1 year ☐	1-5 years ☐	5-10 years ☐	10-15 years ☐	More than 15 years ☐ yes
General Context Questions					
5	What is your role within the organisation?				
6	What activities do you perform on a daily basis?				
7	Describe any devices issued to you by the organisation that are used for your work.				
8	For how long have you been using BYOD?				
	Less than 1 year ☐	1-5 years ☐	5-10 years ☐	10-15 years ☐	More than 15 years ☐ yes

Nr.	Main Interview Questions	Component	Reference
IQ1a	Please describe the way in which you use BYOD? - What personal mobile devices to do use for BYOD? - How often do you use BYOD? - How different is using BYOD to using organisation issued devices	Subject_Tool	Yeboah-Boateng and Boaten, (2016); Mahatanankoon (2015); (Veljkovic, 2018); Weidman and Grossklags (2017)
IQ1b	Discuss how BYOD is different from company owned devices. Can you comment on whether BYOD provides better user experience?	Subject_Tool	French et al (2014), Magruder et al (2015)

Nr.	Main Interview Questions	Component	Reference
	Do you believe this has affected the extent to which you use BYOD?		
IQ1c	Discuss how you are impacted when you do not have your personal device?	Outcome	
IQ1d	Can you comment on whether your use of BYOD results in increased productivity?	Outcome	
IQ2a	Please describe the process involved in setting you up to use BYOD? - Who is involved and what are their roles? - How long does the process take? - What guidelines have been stipulated by the organisation to assist you in setting up - What has been a challenge in setting up?	Division of Labour_Use	Weidman and Grossklags 2017
IQ2b	In what way do you feel impacted by having to setup BYOD?	Outcome	
IQ3a	Can you discuss the work-related tasks that you perform using BYOD?	Object	Yeboah-Boateng and Boaten, (2016); Mahatanankoon (2015); (Veljkovic, 2018); Weidman and Grossklags (2017)
IQ3b	Can you comment on how BYOD has influenced how you perform these tasks? Could you discuss the benefits of using BYOD?	Tool_Object	French, et al. (2014)
IQ3c	Describe how the BYOD benefits impact you specifically?	Outcome	
IQ4a	Describe the challenges you have encountered because of BYOD List the disadvantages?	Object	Mitrovic et al (2014), Adedolapo and Kabanda (2016), Weeger and Gewalt, (2014)
IQ4b	Please discuss how these challenges have impacted you in the workplace?	Outcome	
IQ5a	Describe how BYOD influences flexibility in relation to the tasks that you perform	Object_Task	Gens, Levitas, and Segal (2011); Garba et al. (2015)
IQ5b	Please discuss how this flexibility (or lack thereof) has impacted you.	Outcome	
IQ6a	To what extent does BYOD allow you independence and self-sufficiency? Do you feel it allows for greater freedom in relation to the technology available to you?	Object	Garba et al. (2015)

Nr.	Main Interview Questions	Component	Reference
IQ6b	Kindly describe how this independence and self-sufficiency (or lack thereof) impacts you?	Outcome	
IQ7a	Please explain how your levels of job satisfaction are impacted by the use of BYOD.	Outcome	Garba et al. (2015)
IQ8a	Discuss how you manage the balance or overlap between your private and professional life as a result of using BYOD? How do you manage the workload?	Object	Mitrovic et al. (2014), Schalow et al. (2013)
IQ8b	Describe in what way is your personal life impacted by the balance or overlap?	Outcome	
IQ8c	Can you comment in what way does the balance or overlap impact your attitude towards your work and your employer?	Outcome	
IQ9a	In detail please express what risks you experience or are concerned about, relating to your personal data. How do you maintain boundaries between private and professional data?	Object	Adedolapo and Kabanda (2016)
IQ9b	Discuss your opinion as to how these risks and concerns would impact you directly?	Outcome	
IQ10a	Please share your view regarding the cost implications of using your personal device for work-related tasks?	Object	Weeger and Gewald (2014), Munroe (2013)
IQ10b	Can you comment on how these cost implications impact you?	Outcome	
IQ11a	Describe the rules and policies in place for using BYOD. - What are these rules? - How do these rules influence how you perform your tasks? - Have these rules been formally adopted and communicated to you and other employees?	Rules	Singh (2012), French, et al. (2014), Smith (2017)
IQ11b	Discuss the negative or positive impacts that these rules have on you?	Outcome	
IQ12a	Please explain how BYOD influences how you interact with other employees. - Does it allow better interaction? How? - Does it hinder interaction? How? Is the use of BYOD by a personal preference or is it enforced by your employer? - What BYOD devices do other employees use	Community	(Veljkovic, 2018)

Nr.	Main Interview Questions	Component	Reference
IQ12b	Discuss what support is provided by the organisation, ensuring that you are able to use BYOD?	Community	Crossler et al. (2014)
IQ13a	Can you describe any other challenges that you have experienced as a result of BYOD?	Object	N/A
IQ13b	Can you describe any other benefits that you have experienced as a result of BYOD?	Object	N/A
IQ13c	Can you describe any other ways in which you have been impacted by BYOD?	Outcome	N/A

B2: Sample Interview Transcript

Sample of an interview with JD:

Person	Interview Content	Theme
Interviewer	Okay, the topic that I am looking at is the impact of the use of BYOD on employees. Specifically focusing within the organisation. I have a couple of questions that I will be asking, the questions split into different sections. Firstly I have questions related to demographics, then there are general questions relating to the topic and lastly more specific question. May I please get your job title?	
JD	Java developer	
Interviewer	Do you work in this financial organisation and how long have you been with the organisation?	
JD	Yes I do, 3 years	
Interviewer	And what does your role in the organisation entail?	
JD	Software developer, writing code to meet business requirements mostly in the Customer... space	
Interviewer	What are activities do you perform on a daily basis?	
JD	Reporting on progress, updates on giving feedback on the tasks completed tasks in progress issues we are coming across as well as the actual work which is writing the code to meet business requirements that we get.	
Interviewer	Please describe any devices issued to you by the organisation that you sue for your work.	
JD	The laptop mostly, that is where most of the work happens, that is what is issued. The rest is what is available; boards, projectors, meeting rooms and all that other stuff.	
Interviewer	And what device do you use, your personal device do you use for work-related purposes	
JD	Cell phone	
Interviewer	How long have you been using your device, your personal device for work activities	
JD	A year now	
Interviewer	That is it for the general questions, so moving on to the detailed questions. Please describe the way in which you use your BYOD, your device? So you have mentioned that you use your cell phone: • How often do you use it? • How different is using your device to using the device issued device?	
JD	I mostly use my phone for communication that's emails, Microsoft Teams, WhatsApp. It's communicating with the other team members, that's I guess about it. Well compared to the laptop, I am always with my phone so wherever I am be it a lunch break or even at home before work, I can still communicate with the rest of the team, to give feedback updates or even ask questions.	Use of BYOD
Interviewer	Discuss how BYOD is different from company owned devices. So we are looking at whether BYOD provides better user experience or how difference between the 2 devices has affected the extent to which you use BYOD?	
JD	While using my own personal device, there were certain benefits.	User Experience

	One for example, configurations setup of the tools that you use be it development, be it communication there are things that you do by yourself and it's usually easier than in a red tape situation where you need to wait for Ops to install this, ops to do that for you. If you have control over all those things, it's quicker to set up your device, it's quicker to deliver the work that's required, because you are using things that you are familiar with you using tools that you have set up yourself. And it's not necessarily limited or restricted to what the organisation uses, as long as it's compatible with the rest of the team. So yes, so for example, communicating you using tools like slack, which is like an online tool, you don't necessarily have to have Skype installed or set up for you to do that. I know now we're using Microsoft Teams which are also actually is pretty much as useful a slack. You can have it on your mobile device and still be in touch with the rest of the team. But from the actual work using your own device gives you the flexibility and also ease of use because this is a device, you're very used to. You don't need to adjust or have to settle with what you've been given by an organisation you are comfortable with your device because mostly you get it yourself because that's exactly what you want and you tailor make specific things to suit your own needs, not an organisational device, which comes with a certain set of software and certain a set of restrictions.	
Interviewer	Alright, so considering all that can you discuss how you as an individual are impacted personally by using BYOD as opposed to using the organisation device?	
JD	For one wear and tear, I guess if there's any damage or any issues with the device it is your responsibility to fix it and to resolve whatever issues you're having with it. Unlike an organisational device where you just hand in, it gets fixed or you get a replacement at no cost and within reasonable time, and like working with your own device where replacement is probably dependent on your budget than it is if it's an organisational device.	
Interviewer	Can you comment on whether your use of BYOD results in increased productivity?	
JD	I'd say it does to some extent and there are also limitations and other issues around working with your own device. Some which I've already mentioned, like for example, if you're having a problem with your device, that means you need to fix that yourself and that can take time that downtime can just result in not delivering any work. On the upside, working with a device that you own, you have configured, you are comfortable with, you can easily navigate through different files, locations, even applications that you use, because it's all things that you set up yourself. So that speeds up your work rate that speeds up delivery due to the ease of use.	Productivity
Interviewer	Please describe the process involved in setting you up to use BYOD within your organisation? Talk about who is involved in you setting up the device, talk to the timeframe in terms of, from when you start to when you are actually fully setup.	

	What guidelines or policies stipulated by your employer, giving guidance in terms of how you go about setting up and what is covered in terms of BYOD.	
JD	I would say that with Bank A, there's software that is required in order to set up things like email, Skype or MS teams. Recently they've introduced a customer portal which you have to log into the organisation there's certain restrictions and certain rules that are set in terms of what you can do with the applications that belong to the organisation on your device. Setting all of that up is usually up to you unless if you encounter any problems. For me it was a 10minute exercise to just install, setup and configure, then install your email install your Microsoft Teams, basically which is what I use for Bank A.	Organisational support
Interviewer	Have you experienced any challenge while setting up your device?	
JD	The biggest I guess with your own device is licenses. Like for software development, we use Intelligy and the licensing is quite pricey. So if it's your personal device, your foot that bill yourself and if licenses expire, you don't always have the money to renew so you'll end up having to settle for a different tool or the unlicensed version, which is limited in terms of what you can do with it. And then would definitely slow you down in comparison to having an organisation's device which is set up and licensed organisation,	
Interviewer	In what way do you feel impacted by having to setup BYOD?	
JD	It depends, I guess it's more of a line of business in my sphere of work setting up a device installing programs, configuring tools to use is simple things to me because I do that on a daily basis. But I suppose if it was somebody new to a job new to software development space, they could struggle with that, especially if it's a personal device, configurations are usually different unlike standard organisational device, which the specs and type of software that's installed is generally the same. For example, on my personal device, I will use Linux organisation uses Windows. And to find specific applications Linux is not as easy as it is with a Windows based machine so those could be the challenges, but it depends on your line of work and what exactly you're dealing with.	
Interviewer	Can you comment on how BYOD has influenced how you perform these tasks? • Could you discuss the benefits of using BYOD?	
JD	Currently I use BYOD for communication mostly. For example, we usually work different hours so I can wake up probably six someone is already in the office, I'm at home, and I see an email on my phone, when I pick up my phone with something that I can easily respond to or give direction to somebody. I don't have to wait until I get to the office at half eight or nine to respond to that. I already have the information as soon as the email is sent and respond by six o'clock somebody can action, those things on the email, and it doesn't hinder their progress or delivery because they are waiting on somebody who hasn't even seen the messenger. That's I guess the biggest benefit in terms of communication.	Employee Interaction
Interviewer	Describe how the BYOD benefits impact you specifically?	

JD	I think it's pretty much the same. Personally, I get to know about things that I need to do sooner and if I had different plans for the day, I can alter my plans based on the information that I am getting throughout the day, so it encourages better planning.	
Interviewer	Describe the challenges you have encountered because of BYOD List the disadvantages?	
JD	Quite a few: for one data that's like a cost me myself . two in terms of drawing the line between work time and home time you end up not knowing where they should be doing work-related things or home related things because you are constantly in touch with everything that's going on with the team at the office. So that's sort of a disadvantage, I guess.	Cost Implications Anxiety
Interviewer	Please discuss how these challenges have impacted you in the workplace?	
JD	By virtue of using your own device, if I'm at work, I'm constantly looking at my phone for communication which may not necessarily be from work could be my own personal messages, own personal communication. You end up hopping between work messages, personal messages, and stray from delivering what you're supposed to be doing this because your attention is focused on other things, other things that you're getting on the same device – impact on productivity.	
Interviewer	Describe how BYOD influences flexibility in relation to the tasks that you perform?	
JD	Flexibility comes well from the fact that I can be anywhere, and I can still communicate with the rest of the team. So I don't necessarily have to be in a room with the team to be having a meeting. I can Skype in join on MS teams, just email or I don't necessarily have to make a phone call or come and tell somebody in person. I can just send a message.	Flexibility and mobility
Interviewer	Please discuss how this flexibility (or lack thereof) has impacted you.	
JD	For one, working from home becomes easier. You can cater to both personal and work needs at the same time without one of the other suffering especially in times we you need to attend to something that's urgent at home or the office, you can strike a balance by using your own device.	Flexibility and mobility
Interviewer	To what extent does BYOD allow you independence and self-sufficiency? Do you feel it allows for greater freedom in relation to the technology available to you?	
JD	I'll say it does mean that you're not limited or restricted to location? Even in terms of the type of software that you can use, for example, like with teams it's easier on a device to be situated elsewhere and download, install that on your phone and have a meeting with the rest of the team.	
Interviewer	Kindly describe how this independence and self-sufficiency or lack thereof impacts you as an individual?	
JD	It's mostly a benefit throughout, you're not necessarily dependent on meeting rooms you not dependent on being at a certain place at a specific time, it gives you the flexibility to work from anywhere and still be in touch with everybody else.	
Interviewer	Please explain how your levels of job satisfaction are impacted by the use of BYOD.	

JD	There's increased satisfaction, in that the benefits that come with it, the flexibility that you have; you can work from anywhere and that's something good, you don't necessarily have to be in the office all the time that's plus.	Job satisfaction
Interviewer	You mentioned that there is a need to balance your family and work life. Discuss how you manage the balance or overlap between those points of your life.	
JD	It's a matter of personal discipline, I guess, pretty much the same as the amount of time people spend on social media, Facebook, Twitter what not. At some point you need to cut those platforms out so as to socialize with people actually interacting with everybody else. Similarly, to work and home you can only do so much for the work hours, and you need to do also the same with your personal time and space. So, for example if it means putting all communications from work on mute as soon as you get home that is okay you are within your space.	
Interviewer	And is this how you manage the workload?	
JD	Yes it is	
Interviewer	Considering that you have a way for managing your workload. Describe in what way is your personal life impacted by the balance or overlap?	
JD	From a personal space, getting a message off an urgent issue while you're having dinner, you can easily just stop and jump onto your laptop to fix the problem, which obviously is taking up my time with my family and obviously they would not be happy about that. Similarly, at work if I'm looking at messages from the work group, and there's other messages as well from WhatsApp and I end up going through all the other messages and 30 minutes to an hour you find yourself doing other things. So it sort of distracts.	Work-Life balance/overlap
Interviewer	Can you comment in what way does the balance or overlap impact your attitude towards your work and your employer?	
JD	To some extend yes, for one you feel work is now taking up your time and as much as there's still a lot of work to be done, you should not always be doing all that work and you tend to feel people are taking advantage of you or taking advantage of your availability and that sort of creates a bit of resentment, I guess, in that sense.	
Interviewer	In detail please express what risks you experience or are concerned about, relating to your personal data.	
JD	I'll take for example, this customer portal, in order to be able to use work-related software on your personal device the application requires access to probably your files, your phonebook your certain things which somebody can easily abuse. You won't be in a space to know how much detail they do have of your own personal information on your device and whether you're giving too much access to the organisation to your personal space.	
Interviewer	How do you maintain boundaries between private and professional data?	
JD	I guess it's more of the obligations you use the applications you have one your phone capabilities on your phone to separate access to specific files. handlers take certain applications from accessing certain files on your phone. So yeah, there are some tools which come with some devices some you have to install some you have to set up, but that's like, extra work and effort	
Interviewer	Discuss your opinion as to how these risks and concerns would impact you directly?	

JD	One thing I think I'd be more afraid of is obviously, if an organisation considers your risk and is information on your device, which belongs to the organisation, they have access to, for example, locking your device or erasing certain things from your device, because it's considered the organisation's property, but to what extent that can go and what else they can, like affect you with for example, if your device is not that you need to make important phone calls have indicated somebody else, just by virtue the organisation tried to protect their own data – it would be an inconvenience.	
Interviewer	Please share your view regarding the cost implications of using your personal device for work-related tasks?	
JD	I also use my own Wi Fi router and that is a data cost to me, that is the biggest challenge I guess. When you're dealing with applications that require files to be moved up and down the network and you are using your own internet connection. That definitely is a cost to you which organisations usually do not compensate.	Use of BYOD
Interviewer	Describe the rules and policies in place for using BYOD. • What are these rules? • How do these rules influence how you perform your tasks? • Have these rules been formally adopted and communicated to you and other employees?	
JD	It comes mostly with the terms and conditions of applications, that long thing that you just take accept, which most of the times you don't read, get the nitty gritty of the details for you the and there's no time to sit with a lawyer to go through each line about what they can do. But some of the things have come across in setting up work software on my mobile devices is the fact that they have the ability to erase all that information without your consent without your knowledge.	Privacy and Security
Interviewer	Has anything been formally communicated, for example documented BYOD policies?	
JD	There are emails with documentation, with guidelines and implications and all of that. That is as formal as it gets.	
Interviewer	How do these rules and policies influence how you perform your tasks?	
JD	To some extent with a bit of caution as to what else is organisation capable of doing on my device. So not necessarily within the workspace but in the personal capacity it limits what you want to do on your device because you don't know where the information is stored and who has access to it.	
Interviewer	Discuss the negative or positive impacts that these rules have on you?	
JD	The positive side is I'm don't necessarily have to back up like all my work data on my Google Drive or my own cloud facility somewhere organisation already takes care of that. So even if I lose my device, I can still just reconnect and be back to the same page I was before is on a new device. Like information that is just stored Pacifica Lee for my own use that is just disappears if I do not have automatic backups.	
Interviewer	How does that work? How do they know what information to back up on their server?	

JD	It's probably what application based for example is just my emails and all my emails are backed up on stored on my device and the application has been specified by the organisation.	
Interviewer	How do you then access that application?	
JD	Through work credentials, username that the organisation provides and passwords	
Interviewer	Please explain how BYOD influences how you interact with other employees.	
JD	So there's general communication principles I guess. Verbal nonverbal kind of communication. Things can get lost in translation by talking to someone via messages SMS, what's up, then it is talking face to face great. There's information you don't get about probably how on a comfortable somebody is and on the plus side, it's also just quick communication you don't necessarily have to be in the same place to discuss what is problem or topic.	
Interviewer	So in your opinion does BYOD allow for better interaction or does it hinder interaction? How?	
JD	BYOD does not hinder but better the interaction with colleagues but there are pros and cons. One of them being if I am on a device with somebody in a different location, there is that whole face to face communication body language, which you do not get from talking to somebody over the phone. So that's a negative, but on the plus side, it's more in terms of off quickly getting information across to the next person.	Employee Interaction
Interviewer	Is the use of BYOD by a personal preference or is it enforced by your employer?	
JD	It's a personal preference	
Interviewer	What BYOD devices do other employees use?	
JD	Mostly use their cell phones, and some laptops	Use of BYOD
Interviewer	Can you discuss what support is provided by the organisation in ensuring that you are able to use BYOD	
JD	There's links to support team to contact them with any issues that you do have in setting up your device that comes with the software that you're installing so there's some help and guidelines.	Organisational support
Interviewer	Does that then cover anything any work-related activity that you want to do on your device?	
JD	Not always like, probably when you need it the most. There is assistance but it's not like instant or immediate. You can look ticket like a task for somebody to look at but that's not like a quick resolution to the programmatic space.	
Interviewer	Can you describe any other challenges that you might have experienced as a result of BYOD?	
JD	Yes, when you are reading a document on your cell phone is not as easy as it is on a laptop that's just annoying. I guess going through tiny text on the phone and having to scroll from one end to the other or even editing a document it's not as easy on a mobile device it is on a laptop. Specific software only works properly on a laptop but not on a cell phone so those are challenges you can get.	Device Compatibility
Interviewer	What other benefits have experienced as a result of the BYOD	
JD	One of them being flexibility to work from home, flexibility to work from any location. That's something that comes with having things set up on your own device. You don't necessarily have to wait for desktop, at your desk or anything that's in the office, you can just use your own personal device all of that.	Flexibility and mobility
Interviewer	Lastly, can you describe any other ways in which you have been impacted by the BYOD	

JD	I mean, it's mostly been benefits, I'd say, using a personal device. There's nothing that makes you feel, I guess, as part of a project as part of making something as using things that you are very comfortable with. It just gives you easier ease of use yours you get you more interested in getting something done. Then struggling with a device set up by somebody else, with limited capabilities of limited functionality or an operating system, which is not of your choice.	
Interviewer	Okay, well thank you very much that is all your time has been greatly appreciated. Thank you.	

Appendix C: Sample Supporting Documentation

C1: Software installation guide



ACCESS TO COMPANY DATA FROM PRIVATE DEVICES

This message is important – access to company data from private devices is changing

You are receiving this communication because our records indicate that you have accessed company email on your personal mobile or tablet within the past 6 months. If you no longer access email on mobile, please ignore this message.

A new [REDACTED] security and compliance policy is being applied over the next 4 weeks to all private devices that access company data, including email and other [REDACTED] services.

The process is automated. At the time of the change, when accessing your email or other Office [REDACTED] from your mobile/tablet, your device will prompt you to install the [REDACTED] app, and to accept a new device management profile. Please follow the prompts.

Additionally, access to email and other [REDACTED] services from a private/non-bank PC will be limited to viewing and editing in the browser only.

Tell me more

What will it do?

- The new policy will enforce the same lock screen and PIN controls on your mobile/tablet as you would have had before.
- Your company and private data are now virtually separated on your device so that security controls can be applied to company data only, not your private content.
- Microsoft applications will be required to open company content, including the Microsoft Outlook app for company email and contacts sync, Word, Excel and PowerPoint for company documents, an Adobe PDF reader for Intune to read PDF's, and a specific Intune Managed Browser for opening links embedded in company documents/emails.
- This change will also impact access to company data from private PC's by limiting the experience to viewing and editing in the browser only. Downloading company files, printing, or editing company files through Office will be prevented on non-bank PC's.

Can I register at my convenience?

Should you wish to register your mobile device ahead of the change, please feel free to install the [REDACTED] app and other Microsoft apps you may need from your devices App Store. Sign in to these apps using your [REDACTED] credential. Please refer to the attached guide for additional information.

What about privacy?

[REDACTED] will not have access to, or visibility of, any private content on your phone. It's your private device after all, and we respect that. Please refer to the attached guide for full privacy details or visit the Intune FAQ's on [REDACTED]

Appendix D: Turnitin Report

Signed by Supervisor:

Lyrice Cohen

Lyrice Cohen

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