Fourth Industrial Banking: Case Studies into Digitising Banking Models and The Foreseeable Effects in South Africa

Celine Intombiyenhle Masheleni

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COMPULSORY DECLARATION

This work has not been previously submitted in whole, or in part, for the award of any degree. It is my own work. Each significant contribution to, and quotation in, this dissertation from the work, or works, of other people has been attributed, and has been cited and referenced.

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Abstract

This thesis is a critical, exploratory analysis of the impacts to the banking industry in South Africa, in light of the wave of technological change and emergence, termed in popular discourse as the Fourth Industrial Revolution or 4IR.

The 4IR has been argued to offer the transformative potential to change and disrupt current societal organization and provide opportunities for developing countries such as South Africa to “leapfrog” into development. Many argue that as technology advances and progresses, it can be used to address socio-economic, developmental challenges and deliver services. In the banking sector, particularly in the context of developing countries, as large portions of the population remain excluded from formal financial services, digital banking methods premised on the technologies of the 4IR have emerged as potential “solutions”.

What is often understated, however, that this study highlights, is that such technological advancements hold challenges. Moreover, as they are presented as solutions to the socio-economic difficulties of developing countries, like financial exclusion, it is important that this is understood contextually, and critically and such challenges are presented.

Through primarily qualitative case studies of two banks, Standard Bank and TymeBank, the study aimed to uncover the processes of digitisation occurring as well as the social processes that underlie them. Findings show that indeed, tangible examples of “4IR”/digitisation are identified at the two banks through technical application of emerging technologies, such as cloud computing and machine learning. However, more concerning are the social processes and strategic decisions that result in and out of their adoption.

The 4IR in the context of this study appears to replicate ongoing social and economic inequalities, through inadequate digital infrastructures, and omni-present interests of neo-liberalism presenting as digital capitalism. Additionally, carrying concern of adverse effects to the employment and labour landscape, the 4IR is deconstructed for its rhetorical meaning which contrasts with the reality. Hegemonic representations of a 4IR and its proposed ‘transformative benefits’ do not correspond with actual phenomena and risk the neglecting of fundamental social challenges that are deepened by and new ones emerging out of digitisation.

Keywords: Fourth Industrial Revolution, Financial Inclusion, Financial Exclusion, Digital Banking, Technology & Society, Development Studies

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To my lifelong teacher, a bouquet of roses on your legacy of learning

Esther nee Madzima Nyathi

1953-2005

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Glossary/ Abbreviations

4IR	Abbreviation of 'Fourth Industrial Revolution'
AI	Artificial Intelligence
Customer onboarding	The process of helping new customers get started and stay engaged with a business service.
Legacy systems	Legacy systems are old methods, technologies, and computer systems that may be outdated but are still in use as they support current key functionalities.
NLP	Natural Language Processing
POPI/A	Protection of Personal Information /Act
SMS	Short Message Services, SMS is the text messaging service component of most telephone, Internet, and mobile device systems.
USSD	Unstructured supplementary service data, or USSD which are quick codes users can enter into their phone to communicate with the mobile network operators' computers, thus enabling access to banking services through telecommunications,

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Chapter 1

Introduction

1.1 Topic

The discourse of the Fourth Industrial Revolution (4IR) has mainly been led by Professor Klaus Schwab from the World Economic Forum, who defines it as a wave of technological change, driven by

"The fusion of technologies, that blur the lines between the physical, digital, and biological spheres, ushering in a world of potential to be exploited across the various sectors of human life, characterized by the emergence of complex technologies, such as artificial intelligence, machine learning, big data, and biotechnologies amongst others" (Schwab, 2016:1).

This was further developed in Schwab and Davis' 2018 book*, Shaping the Fourth Industrial Revolution*. Whilst Schwab and Davis conceptualised the 4IR, its constituting technologies had already begun appearing in literature as early as 2014, with work from Andrew McAfee and Erik Brynjolfsson that identified various emerging technologies such as Artificial Intelligence and Robotics. Technological change and emergence in society is not new, but what has brought the 4IR into the spotlight, for Schwab and other 4IR advocates, is not only its "unprecedented and exponential rate of growth", but also its alleged potential for transforming and disrupting current societal organization compared to earlier 'revolutions' (Schwab, 2016). This is mainly based on three principles (1) velocity, (2) breadth and depth, and (3) systems impact. Velocity refers to its rate of growth, which unlike previous revolutions, is exponential- as Schwab argues, due to the multifaced and interconnected state of the world today technology is developing much faster. Breadth and depth speak to the capacities of its constituting technologies, which lead to the final principle and result in unprecedented paradigm shifts in economies, businesses, countries, and even the individual (Schwab,2016).

From the context of a developing country such as South Africa, the concept of a 4IR raises pertinent questions. I questioned its applicability, and the benefits and risks associated with not only the idea, but also its constituting technologies. Is the 4IR a worthy pursuit for developing countries? This is a big question. Whilst results and outcomes may vary across different sectors, for the purposes of this thesis, I explored it through a single sector, -financial services. I chose financial services because it is one of the more prominent industries currently experiencing the effects of technological advancement and 4IR yet is also closely linked to the socio-economic development of a country. I aimed to uncover whether indeed a revolution was occurring, and the impacts this would have on social development efforts in this sector - such as financial inclusion. I wanted to know how actively banks were leveraging on the technologies of the 4IR, what motivated them, and what effects or risks this would pose for the society.

Thus, the main research question, this thesis addresses is:

What are the foreseeable impacts of the 4IR and its technologies in the banking sector of South Africa, particularly within the issue of financial exclusion?

1.2 Setting the Scene: Financial Exclusion and Under-banking in South Africa

South Africa is considered to have a continentally and globally leading banking system, backed up by legal and regulatory frameworks aimed at systemic stability of the economy, institutional soundness, and the protection of consumer rights (Arora & Leach, 2005). At an infrastructural level, Standard Bank – a South African bank- was quick in rolling out the Auto-bank and Automated Teller Machine (ATM) as part of its offered services in 1981, making it the first on the continent to do so. Furthermore, the concept of mobile money was invented in South Africa, in 2002, when Hannesvan Rensburg, CEO and founder of Fundamo (Fundamentally Mobile) collaborating with CelTel Zambia, launched a mobile money platform using Short Message Technology (SMS) – the first of its kind (Marwa, 2016; Padhi 2018). Whilst making infrastructural strides such as this, the extension and reap of their benefits have remained narrow.

Following the exclusion of black people from social and economic participation during the segregation period and apartheid, historical inequalities, and ongoing socio-economic disparities, have resulted in the financial exclusion of a large population in South Africa. Many people do not have access to banking services, or where access has improved use remains low (Louis, & Chartier, 2017; Arora & Leach, 2005). In 2018 an estimate of 11 million or 23% unbanked and underbanked adult South Africans was recorded (Intellidex, 2018). In Arora and Leach's 2005 report, of 9.4 million then unbanked population, 88% were Black, 9% Coloured and the remaining 2% were Asian and White (1726). Additionally, spatial segregation, remnant from the apartheid era, made banking inaccessible to majority black people living in rural areas and townships where banks did not operate (Arora & Leach, 2005). A study by Wentzel et al, in 2016, of the factors influencing financial exclusion in South Africa, confirms that not much along historical patterns of disadvantage has changed. The study found that people with lower levels of education, and/or whose primary sources of income were informal employment, government grants and dependence on working family had a higher likelihood of being unbanked. These challenges largely faced by previously disadvantaged groups- such as black and coloured communities.

Some studies have also argued that low financial literacy results in financial exclusion in South Africa (Matamane, 2018; Botha 2014). Such analysis, however, fails to account for the reality of circumstances of extreme poverty, in which many South Africans who are financially excluded find themselves in. As Wentzel (2013) argues, the way the poor manage their money is appropriate given the high levels of uncertainty they are exposed to. Arguments premised on financial illiteracy as a major cause for exclusion tend to ignore the often-predatory nature of financial services providers themselves. For example, banks have been argued to feed into the issue of financial inaccessibility and exclusion through, the creation of high levels of consumer debt through high interest rates which become unaffordable for many (Sibanda & Sibanda,2016). A case of this was recorded when the government directly deposited social grants in people's bank accounts. Financial corporations "targeted" grant recipients with products like micro-loans and funeral coverage, of which costs were automatically taken from their accounts as soon as they received the grants (Ikdal et al,2017). This unfortunately left recipients with only little left-over change, prompting investigation into the financial companies' activities.

Other studies have reported that South Africa's bank fees are often unaffordable, for the lower-income segment (Ikdal et al,2017; Arora & Leach,2005; Sibanda & Sibanda,2016). In 2004, the Banking Association of South Africa, in line with the requirements of the Financial Sector Charter to transform the banking sector to be inclusive of previously disadvantaged groups, including black people and enterprises, as well as women, launched the Mzansi Account initiative with the four big banks in the country: Standard Bank, Absa, Nedbank, First National Bank. This initiative was a fee free bank account that only required R10 and an ID to open and no minimum balance to maintain. The Mzansi account initiative was implemented to address the issue of high bank fees, however, a study by the Bankable Frontiers Association, (2009) reported that whilst it was very successful in encouraging the target consumer's uptake with banks, usage and activity on the accounts slowed down after a short high momentum period and remained low thereafter. There was feedback from the market, that the accounts were perceived as 'the poor man's account' due to them being positioned separately from other banking products (National Treasury of South Africa, 2014:8). The lesson from the Mzansi initiative in addressing the issue of high fees, was that simply ensuring that people have access to bank accounts was not enough to facilitate impactful financial inclusion. Without the tangible transformation of their financial and economic circumstances, a bank account alone simply would have no sustainable value in the long term.

Other reasons for exclusion were due to logistics. For instance, to access banking services certain paperwork, such as IDs and proof of residency are required, some people may not have such paperwork readily available (Abrahams,2017). Many people who run small or informal businesses do not meet the requirements necessary for formal financial serving thus limiting accessibility.

Mohieldin et al (2011) explore the role of religion in financial inclusion and exclusion. For instance, although some specific financial products may not be attractive to some customers premised on ethical or religious grounds, where non-usage seems voluntary, the question of accessibility can still be asked if there are no alternatives offered, for instance, Sharia compliant financial products. They argue that although financial instruments that comply with Islamic financing precepts are emerging, there are still identifiable gaps.

Due to the reasons as discussed above, the poor often turn to alternative, informal means of financial services. In some cases, community-based banking channels such as stokvels or Umgalelos- agent banking- are used as more community-oriented approaches for financial services. In other cases, unregulated loan sharks known as mashonisas provide credit services (Ikdal 2017).

The challenge of financial exclusion can be best understood as a result of systemic issues, that prevent the poor and disadvantaged people from access to and use of mainstream money services. However, the need for formal financial servicing and banking cannot be undermined and has been generally linked to socioeconomic development (Ikdal et al, 2017; Arora & Leach, 2005; Abrahams, 2017).

1.3 Enter the '4IR': Questions and Foreseeable Impacts

The recent discourse surrounding the 4IR and social and economic development, has been that it offers the potential for systemic impact, which can be an opportunity for addressing socio-economic disparities and challenges that marginalized communities experience- such as financial exclusion and under banking (Shipalana,2019; Ohene-Afoakwa & Nyanhongo,2018). The incorporation of tools such as artificial intelligence and cloud computing, is proliferating within the sector (Coetzee,2018). As such, digital banking models have recently emerged through the increasing use of technology in bank-client interactions and service delivery, for example- AI chatbots in customer services instead of person-to-person inquiries, the collection of digital data used for tailored marketing or product development or fully digital banks operating on cloud platforms. The use of technology is well on its way to structurally changing the make-up and form of the bank as it is traditionally known. As technology becomes a more prominent feature in the everyday lives of people, many day-to-day tasks such as banking are migrating to digital channels through the use and availability of technologies and the smartphone enabled by internet connectivity. Banks have touted advantages such as ease of access, low-cost operations, and increased efficiency in service delivery, thus are moving towards adopting technologically driven practice (Coetzee,2018). This motivates my research question on the impacts of such innovations and advancements. Against the assertions of the 'transformative potential' of 4IR, I ask can it be consolidated to ensure that the models that emerge will in fact address the challenges of financial exclusion in South Africa or will they reproduce and perhaps even further reinforce such divisions, and how?

To answer these questions, I adopted a critical lens that considered the 4IR from several different angles in my specific questions. I considered the *technical changes* occurring, are banks in fact integrating 4IR technologies and to what extent? Coetzee (2019) argues that banks are increasingly moving towards systems integration of technology in their operations, although have assumed a more conservative approach in the case of South Africa due to banks being generally risk averse.

I also considered the *social impact*s; What effect will these technological developments have in the context of South Africa's socio-economic landscapes? The analysis on social impacts explored the argued capacities of technologies as purported to address socio-economic challenges such as financial exclusion. Scholars such as Caruso (2017) or Sutherland (2019) have argued that such proposition is merely rhetoric and a form of technological determinism. Technological determinism proposes that "forms of society are dictated by the requirements of operating a technological system of some complex degree therefore social change is driven by and depends on technological change" (Ingold,1997: 106). This has been a largely contested proposition by many writers on technology and society, who argue that technologies and their diffusion are a result of social and political systems and structures in place instead of the other way (Noble, 1984; Sabel & Zeitlin,1985; Valenduc and Vendramin 2016; Adams,2021).

Finally, I considered the *external and regulatory environment*, which explored the regulatory, and socio-economic structures in place and how they facilitate or bar such technologies, as well as to what effect. With regards to regulation, other scholars have raised concern on the policy implications and regulatory capacity of South Africa regarding emerging technologies. Webster (2020:2) argues that emerging digital technologies have resulted in a "disconnect between labour legislation and social protection systems". Digital technologies are creating a gap in legislation which if not accounted for as Hlatshwayo (2019) argues, could result in adverse effects in social systems currently in place. Within the literature, the most obvious example was effects on employment. Whilst regulation has also paid close attention to the area of ethics in data collection for example, there are gaps in consumer or social protection responses to how digitisation would restructure economies, wealth distribution, and to the concern of this paper- access- to services that are increasingly becoming more digital. Sutherland (2019) argues that a track record of poor governance has resulted in failure to create economically enabling environments for digitisation in South Africa. I would add equitably as well.

To explore these questions, I carried out two instrumental case studies of two banks in South Africa. I collected data through semi-structured in-depth qualitative interviews with employees at these two banks, as well as secondary sources such as bank reports, and other documentary sources.

The findings present as two unitary case studies, which both highlight active digitisation, through the implementation of technologies and strategic decisions at the banks sampled. The findings also showed that the utility of technologies in addressing social challenges as purported may be limited. I identified challenges such as effects on employment in the sector and the economic ramifications of that, persisting digital inequalities, and the unaddressed dangers of technologies which pose as further risks. I found that the actors and motivators behind digitisation strategies are not always inclined towards an equitable approach. Therefore, in addressing socio-economic goals such as financial inclusion- the *active use and access* to a full suite of quality financial services - my findings demonstrate, hegemonic representations of a 4IR and its proposed transformative benefits do not correspond with actual phenomena and risk neglecting fundamental challenges that may be deepened by and new ones that emerge out of digitisation. Deconstructing the rhetoric surrounding the 4IR leads to the main argument of this thesis which is that that technological evolution alone does not result in inclusively oriented transformation of already existing social and economic inequalities.

To build the theoretical framework of this study, the following section-the literature review- presents some of the critical debates surrounding the recent technologies of the 4IR, particularly through lens of their proposed potential in transformation towards a more equitable future. I particularly appreciate some of the critiques that have emerged to challenge the representation of technologies and the 4IR, which are often uncritical, and ignore the nuances of how technologies may adversely affect marginalised communities in society.

Chapter 2

Literature Review

2.1 Introduction

The Fourth Industrial Revolution has amassed debate and critique, particularly in the advent of its public and political popularity. Writers such as Caruso (2017) and Sutherland (2019) have argued that private, public, and political institutions have created a rhetoric around the 4IR, which suggests imagery of futuristic developments leveraged on a set of novelle, and spectacle technologies. With the leadership of the World Economic Forum at its flagship, the 4IR has created a public and political buzz, or what Caruso (2017) terms 'institutional narratives' which mainly propose positive effects. At a local level, after being newly elected, the President of South Africa, Cyril Ramaphosa included the Fourth Industrial Revolution in his plans for the country's economic policy (Sutherland,2019:233).

The reality however, as many critical scholars have argued, is that such representations, often neglect critical concerns surrounding industrial revolutions and technology; more specifically in this context, the 4IR. The key debates emerging from current literature raise concerns on issues such as the effects of technology on employment, digital divides and inequalities, and the overall macro-theoretical critiques surrounding technologies as agents of capitalism or western imperialism- this would also include debates on ethical practice. Scholars warn that such discontents are often ignored by the advocates of technologies and the 4IR, offering a divergent position to what hegemonic representations of the 4IR by policy makers, banks and international institutions have been (Caruso, 2017). Whilst some studies such as Hlatshwayo (2017), have begun sociological research into how such technologies manifest in societal organisation, especially from an African or developing country context, it is still a relatively unexplored area in research. This study aims to contribute towards a more critical understanding of technologies and the concept of 4IR from a sociological and developmental perspective. I would hope that this would be useful in deconstructing the rhetoric of 4IR towards a more pragmatic understanding of technological changes and the realities of what they offer for development goals -such as financial inclusion.

2.2 The Effects of 4IR on Employment

One of the main contentions of digitisation in the context of South Africa is the adverse effects on employment. Studies currently estimate that at least 35%-67% of jobs in South Africa are at risk due to automation (Hlatshwayo, 2019; Millington, 2017). Job losses in the manufacturing, and banking sectors attributed to automation have been recorded, along with the propositions by Schlogl & Sumner (2020), that in developing countries low and medium skilled workers face the greatest risk. For Sutherland (2019:233) this is part of the neo-liberal effects of 4IR that are often overlooked, however would lead to 'depressed wages and increased inequality'. Through the collaboration between the private sector and international bodies, the 4IR, emerges from a more capitalist onset, as what he terms an "auto-cannibalism of business models" (Sutherland,2019:237). This means increased innovation, allows for increased competitive pressure for businesses to reimagine themselves in order to capture more revenue. This re-imagination is realised through the restructuring of labour, which results in loss of employment for human workers. Technologies enable businesses more flexibility in their strategies which then makes them unpredictable as they are always at a moment of re-invention. This flexibility, however, has placed human labour in precarious condition at the risk of automation.

Hlatshwayo develops along a similar argument, stating that the 4IR is being introduced into the labour process as a means of affording capitalist institutions 'greater power and control over production processes' (Hlatshwayo 2019:26). Hlatshwayo assumes a Marxian approach in which he contemplates that the role of technology in a capitalist mode of production is based on profit maximisation (Hlatshwayo, 2019: 27). As technology enters the work force, its fundamental role is to achieve productivity at a faster rate, and at the same, if not less, costs, thus the cost of labour can be recovered by businesses as profit. Therefore, he argues, technology in the workplace is not as neutral as often assumed by those who "uncritically embrace the 4IR" but should be seen as a driver of inequality to the disadvantage of the working class (Hlatshwayo, 2019: 27). The reality of this particularly in the context of a developing country such as South Africa where inequality is prevalent, the trends of digitisation are likely to result in the concentration of wealth in a few, whilst workers are alienated in the workplace or completely removed- as trends of unemployment show. Where employment and income generation are directly linked to quality of life, automation, and digitisation for increased turnovers, comes at the consequences of loss, poverty, and inequality. Mahlatsi (2020) adds to the effects of technology on labour through a gendered perspective- which from my review was an identifiable gap. She writes, the current 4IR could result in the exclusion and further marginalisation of especially vulnerable communities namely black women in South Africa- of which the industries they dominate such as retail and hospitality are at the highest risk.

2.2.1 The Myth of "Upskilling"

The main response to the negative impacts of 4IR on employment have focused on "opportunities to upskill". For instance, Mamela et al (2020) argue that banks should re-skill their workforces to adapt to AI technologies and remain relevant in 'the future'. They argue that the banking workforce must be able to cooperate and collaborate effectively with Artificial Intelligence, to increase efficiency and foster "futuristic innovation" and continuous growth. Ngepah et al (2021) suggests that the South African government should prioritise the upskilling of the labour force, in order to contribute positively towards value-generating economic activities. They argue that companies should take the lead in facilitating the upskilling and reskilling of their employees to preserve jobs, this, according to them is because high levels of skills produce high level outputs of productivity.

However, other writers have highlighted challenges to this proposition. For example, Goger & Jackson (2020) argue that the idea of "upskilling" itself is a myth, that frames labour market problems as the burden of low-income and displaced workers. In order to survive the loss of jobs, workers are encouraged to simply learn some skills -which are often narrowly defined to a set of technical skills. The contradiction here is that as technologies allow for labour restructuring through the redundancy of unskilled or low skilled human workers, it also effectively narrows the doors of employment whilst 'upskilling' focuses on the non-problem of skills deficits (Rathelot & Van Rens,2020). The introduction of technology leads to a deskilling of a larger portion of South African workers whilst upskilling the few who attain the technical skills (Le Roux, 2018; Chigbu & Nekhwevha, 2020; Hlatshwayo,2019). This may be due to the disproportionate threat to jobs that mainly affects unskilled workers, or limited access to the online courses and learning platforms which provide those credentials. Allais argues that the emphasis on upskilling, particularly in the South African context, neglects the "inadequate social security and inequalities" exposing the challenges of market-led vocational education approaches such as those suggested by "upskilling" (2020:639). Additionally, the focus on upskilling detracts from the fact that unemployment in South Africa is already high, which studies have credited to economic policy failures, the education system, and systemic disadvantages for marginalised people such as black and coloured communities (Maisiri & Van Dyk, 2021). The approach of up-skilling does not offer solution to those problems, but rather uncritically re-frames them a skills deficit argument.

2.2.2 Regulating the New 'Plantation'

As technologies restructure employment patterns, they also institute changes in the work environment itself such as how remaining workers are viewed, and work is conceptualized.

For example, the increasing capacities of worker surveillance. Ouma (2020) argues that 4IR in Africa presents an instance of modern-day slavery in its objectification of black bodies in the workplace through the disappearance of checks and balances, as technologies such as artificial intelligence offer unseen possibilities for controlling the labour process and labouring bodies. He draws linkages between the plantation as a site of surveillance and control of labour, and how this would replicate within the digital space through such technologies. Adams (2021) locates this within the history of the commodification of the human body -for labour- during slavery and colonialism. Adams draws from the work of Mbebe (2018) arguing that blackness "becomes the prototype for the assemblage of the human-object of modernity" (Adams,2021:177). This means that, the way black labouring bodies were viewed in slavery and colonialism, as non-human or for the purposes of labour and serving imperial and capitalist interests, becomes the blueprint for the development trajectories of technologies such as AI.

In such representation, the linkages between historical attempts of exclusion and control, and modern imitations through such technologies, perpetuate fundamentally similar principles.

Webster (2020) explores an emerging outcome of the introduction of technologies into working patterns arguing that as technologically driven platform capitalism creates new business models, work and workers have come to also be conceptualised differently- for example, independent drivers for food delivery or ride sharing platforms that are based on mobile applications. The companies that drive this model of platform capitalism have been criticised for precarious working conditions for those signed up as service providers under their applications, showing the need for the regulation of labour markets and increased social protection in a hyper technology economy. As a new 'worker' is created under platform capitalism, a new response towards regulation of these companies is necessary. In this case, Webster notes "hybrid forms of union-like organisations" emerging alongside traditional trade unions to defend the needs and interests of workers in the digital economy (2020:8). The distinction Webster makes between traditional unions and new ways of organising for workers, is quite interesting and highlights the sectoral differences in how technologies impact industries. In the case of my study, the companies I looked at were not necessarily platform companies, yet were having significant impact on employment structures, as well as witnessing changes in the conceptualisation of work- for example Tymebank referring to workers as '*Ambassadors'* instead of a worker/cashier[1]. This was an interesting addition to consider how labour should be organising around issues of the 4IR.

Whilst there has been some reaction from more traditional labour organisations and trade unions against the threats to employment that digitisation and the '4IR' impose, Hlatshwayo argues that the response from South African unions to conduct research into issues brought about by technologies has been lacklustre (Hlatshwayo,2017). This leaves low skilled workers at the biggest risk and impact of job losses.

The significance of considering the impact of technologies on employment be it through job loss threats, inadequate responses to deskilling, or changes in labour organising, in relation to my research question, is the direct economic impact this would pose, potentially exacerbating social challenges such as financial exclusion. Simply put, as Wentzel et al (2016) found, lack of formal employment was a direct factor to being financially excluded, therefore these effects on the employment and labour landscape as

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consequences of digitisation are a considerable challenge. However, despite the admission that the 4IR will present challenges in employment patterns many do still propose generally positive outcomes, although many academics are sceptical of how this will play out, especially in the context of South Africa (Hlatshwayo 2019; Adams 2021; Sutherland 2020; Benyera, 2021).

2.3 The Digital Divide

Another contentious issue of the 4IR in South Africa is found in inequalities of the distribution of wealth and resources, translating over to the digital channels otherwise known as 'The Digital Divide'. The digital divide highlights the gap between individuals, or countries that have access to technology and those that do not (Kroukamp,2005). This ranges from physical access to devices such as computers and smartphones, as well as high speed and quality internet access, to deeper issues such information technology literacy and skills. Whilst South Africa is regarded as one of the more industrialised countries in sub-Saharan Africa, research has identified gaps in access along demographic socio-economic factors such as race, income, education, and gender. A study by Afrobaromater showed that individual use of internet and mobile internet access was lower than had been estimated in literature (Bornman,2015). The study also found considerable gaps along gender and education levels, for not only internet and computer use and access but mobile ownership too. In South Africa, the divide is also spatial as rural areas remain largely underserved in access to telecommunications and internet connectivity (Lembani et al, 2019). Kroukamp states that service providers are reluctant to branch out to rural areas, placing those that reside there at a disadvantage.

The divides in access raise concern over the reality that digitization will entrench and possibly cause further division and inequality. Hlatshwayo argues that the "failure to unpack the roles of new technologies in South Africa and the Global South is likely to deepen existing technological, economic, and social gaps" (2019:26). Historical socio-economic discrimination against black and minority groups means that the disparities in access to information and communications technology run along such lines even today. Other official reports have confirmed that 'emerging digital technologies exacerbate and compound existing inequalities, many of which exist along racial, ethnic and national origin grounds' (Adams, 2021:177;).

The digital divide underlines concern that people may be left behind, and excluded by the increase in digitization, particularly in critical services such as banking. Fundamental requisites such as access to internet, electricity amongst other socio-economic needs would still require critical attention.

2.4 Digital Colonialism: Locating 4IR in Historical, Social and Theoretical Frameworks.

With the critical consideration of the issues discussed above, it is important to understand this "wave of technological change" as more than just technology. For Sutherland, the 4IR emerges as a rhetorical device exploited by those with interests in creating "economic and commercial futures, hoping to ride waves of Schumpeterian economic disruption caused by extreme automation and extreme connectivity." (2019: 233). He cautions the strong participation of private companies alongside international organizations such as the World Economic Forum in blurring the realities of the impact of these technologies. Sutherland's critique especially lands on the South African government's poor track record in implementing policies and regulations such as those which may be necessary for the "4IR", including "ethics, cybersecurity, data protection, education, infrastructure, and skills" (2019: 235). Slow progress in these legal and policy frameworks, has proved challenging in South Africa, opening an exploitative opportunity for private companies, whose actions would have negative social and economic impacts on the majority (Sutherland, 2019). Hlatshwayo adds, that this is most likely to benefit global north corporations who dominate the tech industry simultaneously enabling their extractive practices (2019). Although Africa is one of the biggest producers of unprocessed metals used to make the hardware for these technologies, the economic benefits are largely ballooned into foreign hands whilst the benefit in African countries remains low and unevenly distributed.

Beyond the extractive exploitation, for Kwet (2019), the 4IR and its technologies pose threat of a new form of 'colonialism' facilitated through American Big Tech companies. Kwet argues as market dominions, American companies such as Amazon and Google are afforded greater control through digital technologies, thus giving them direct power to mediate the digital experiences of users. Kwet also argues that colonialism is an ideological process which justifies its conquest, as such, western doctrines on which the narratives of the 4IR are predicated, facilitate tech hegemonies and ideological domination (2019:16). In her article, the 'Algorithmic colonisation of Africa', Birhane (2019) grapples with similar concerns. She argues that an overexaggerating of technological capacities to transform complex social challenges in Africa is negligent of the societal bias and unfairness inherent to such technologies particularly to minorities, whilst facilitating a re-colonisation through supposed "data driven", "data rich" approaches by foreign tech giants such as Microsoft and Google. Moreover, such data is often used to propagate negative narratives which are punitive, for example data used to make predictions on who is more likely to commit a crime or default on a loan (Birhane 2019). Further critiquing the acontextual collection and usage of such data by foreign actors, Abebe et al (2021), note that they also perpetuate 'deficit narratives' which only highlight insights on poverty, illiteracy, and other negative stereotypes of African stories, neglecting fundamental contextual considerations. They raise that the implications of this are such that colonial style oppression is reimagined through the use of "powerful" data and digital technologies in data practices (Abebe et al, 2021). A particularly interesting point they make is that in the same way traditional and colonial powers justified colonisation through rhetoric such as "educating the uneducated", the 4IR digitisation processes use similar colonial rhetoric-i.e. 'liberating the bottom billion', 'helping the underbanked', 'connecting the unconnected' and particularly in Africa 'opportunities to "leapfrog" poverty into development' (Abebe et al. 2021: 7). They echo concerns by Kwet, of the dominance of foreign companies such as Amazon, Google, and Facebook who are on the gainful end of the power struggle within data practice in African contexts and stand to disproportionately accumulate wealth off such practice. As Abebe et al, question the acontextual application of western data models, Adams (2021:177) similarly critiques the commodification of human experience through datafication where "an assemblage of data points" is uncritically taken as "a sign of the real". Adams highlights the dangers of this as producing biased, and untrue insights which perpetuate the algorithmic colonisation of Africa.

To digest these critiques through a development studies perspective, A more macro-theoretic critique offered by Matunhu (2011) helps recognise the role of technologies in constructions of 'modernity' which he – and many other development theorists (Frank, 1967;

Rodney 1972) critique as erroneously presenting development as a homogeneous continuum whilst neglecting historical contexts. The historical complications on the enforcement of modernity as a path towards developmental actualisation implicate the 4IR to the shortfalls of modernisation theory which fails to articulate the true relationship between the developed world and the poor, which has historically been one of exploitation. Adams refers to a discontent of digitisation as the project's impulses towards a "neo-Darwinian linearity of the evolution of science" which would consequently "leave behind" those who do not conform or catch up (2021:178). I found applicable to say, it is also reminiscent of a Rostowian approach to development, which has been largely rejected in Global South Contexts. The Rostowian approach proposes that development occurs in sequential stages from agrarian to industrialised, similar to how technological progressors assume an upward mobility through development as technologies advance[2]. However, with issues such as the digital divide, adverse economic impacts such as unemployment, and extractive and colonial undertones, the narrative of a 'Fourth Industrial Revolution' as an opportunity to leapfrog Africa into a stage of development is flawed too. Rostow's theory of development is criticised as homogenising Eurocentric experiences on to African contexts, as it makes the naïve assumption that all countries will go through similar trajectories of development, whilst negligent of important social, historical and economic factors, for example colonialism and ongoing exploitation. As in history, the economic development of Europe and western countries is foundationally based on the underdevelopment of Africa through the exploitation of natural and human resources, similar patterns continue to be visible in the Fourth Industrial Revolution and technological advancement, thus the developmental capacities of '4IR' and technologies can be similarly criticised. As Kwet, (2021) explains, classic colonialism was rooted in ownership and control of territory and infrastructure, the extraction of labour, knowledge and commodities, and the exercise of state power. In today's digital economy similar themes are noted where the sustenance of the digital economy is structured in such a way that places Big Tech corporations as the primary winners, whilst poor working-class Africans are exploited. For instance, the mining of natural resources such as platinum, copper and cobalt, which are used to build the hardware systems of the digital economy, is largely

2 Rostow, W. W 1959. The Stages of Economic Growth. *The Economic History Review*, 12(1): 1-16

performed by underpaid and exploited workers in Africa, where even reports of child labour have been made (Kara, 2018). In a landmark case, Apple, Google, Dell, Microsoft, and Tesla were named as defendants in an inquiry into the injury and or death, of 14 Congolese children who were killed or injured whilst mining for Cobalt, used to power smartphones, laptops and electric cars (Kelly, 2019), The case cited themes of unjust enrichment, forced and child labour which are often hidden yet present in the supply chains of big tech companies.

Ultimately, perpetuating an unequal global order, where dominant big tech corporations control the majority of technological advancement and innovation, disproportionately benefit financially, participate in mineral extractions, as well as data extractions, whilst exploiting cheap labour, lax regulations and sustaining permanent systems of dependency of the global south.

2.4.1 The Way Forward

With due consideration to what has thus far been discussed, some scholars such as Hlatshwayo argue for the design of socially useful technologies to specifically address social and economic burden; technologies must be designed to "deal with local problems" (2019:21). He states that it is the responsibility of key stakeholders of social justice and development such as intellectuals and activists, NGOs and trade unions to "democratise the debate on 4IR" allowing people in the grassroots access and opportunity to have a say about technologies that would actually improve their lives (Hlatshwayo, 2019: 29).

Birhane proposes a more critical approach arguing that before the import of high tech sophisticated foreign adoptions, should be the question of their underlying purpose and who they ultimately benefit.

Adams (2021) however questions the feasibility of a 'benevolent AI' or tech. She argues that whilst the questions surrounding the way forward seem to ask, 'What can decolonisation mean for AI', so to speak, how can the critical ideas of decolonial thought be applied to AI- and tech? She instead advocates for a 'necessary shift' in perspective that asks what AI means *because* of colonialism (2021:178). For Adams, the decolonial project must be broad enough to even imagine a future that can abandon technologies like artificial intelligence. In my view, this is an important shift to make particularly when considering the implications for social protection of marginalised groups or achieving deep seeded developmental goals.

2.5 Theoretical Framework

The relationship between people and things can be approached from several different directions. American sociologist Thorstein Veblen had coined the term technological determinism to explain one such interrelation of technology and society, arguing that, technology has an inherent tendency to develop from simple to complex and that as it so does the associated forms of social organization and culture likewise undergo complexification driven by underlying technological requirements. (Ingold 1997:106).

An alternative thinking from determinism is technological possibilism, which holds that, technology exerts no influence on the forms of society beyond setting outer limits on the scope of human action, thus society & culture are said to follow their own historical course, irrespective of the nature or complexity of the technological system (1997:106).

However, such deliberations on matters of technological artifacts and usage have been mainly structured by the concepts and categories of western modernity (1997: 106). As Ingold critiques the failures of both these theories is that they make 2 assumptions.

1. Technology exists in an objective system of relations which lie outside the realm of the social
2. That technology can be scaled in terms of degrees of complexity in a linear fashion

In building the theoretical framework of this study, Ingold's first critique is particularly important. The assumption of an objective technology is negligent of critical factors, such as those discussed in the literature review, that may hold negative impacts, particularly in global South Contexts. This premises my study under the assertions by the rising scholarship that consider the detrimental effects of emerging technology, such as impacts on employment, digital colonialism, and exclusion via the digital divide amongst others. Critiques by scholars such as Kwet (2019), Birhane (2019), and Hlatshwayo (2017;2019) provide a framework that helps to contextualise instances of technological change and expose naiveties of deterministic application of technologies, particularly as solutions to socio-economic challenges in developing country contexts.

Therefore, the theoretical assumptions of my study reject the determinist approach rather opting for the idea that how the global order was historically organised and is currently perpetuated, influences the impact that technological developments such as those suggested by the "4IR" have in African contexts. This is to premise that technological change does not occur in a vacuum and must be understood within the history of colonialism, and current condition of neoliberalism. In departing from this understanding, this framework opens avenues towards explorations of undertones of digital colonialism, power imbalances by western Big Tech companies, marginalisation of workers, digital divides, and surveillance culture. As a deliberation of the application of technologies in South African societies in relation to development efforts such as financial inclusion/exclusion, awareness of such concepts will be important.

2.6 Rationale of Study

As Hlatshwayo contends, developing a critical understanding of technology, its history with colonialism and role in context of capitalist production is critical because it "helps to temper the high expectations of the 4IR" (2019:28). In the financial services sector, Shipalana (2019) states that the proliferation of digital services can be credited to the convenience, efficiency, security offered to businesses and consumers. Financial services providers are leveraging digital technologies to advance their own growth and sustainability in order to remain relevant, and 'avoid risk of extinction or failure' should they not 'adapt'. Additionally, digital financial services are argued to offer positive outlook, especially in opportunities for lower income customers through enabling non-traditional entry points into formal banking. Shipalana (2019) recognises alternative platforms from physical branches, utility in biometric data for customer identity verification where national identity systems fall short, increased data insights, mobile wallets, and low costs as benefits of digitisation. She argues that branch traffic is driven by less profitable market customers, whilst more affluent and younger generations opt for digital services. Coetzee (2018) similarly argues that integration of technology in bank operations is vital for maintaining competitiveness in today's market.

However, some of these narratives fail to fully and critically, appreciate the challenges of digitisation and the 4IR which were raised above. Prior to even the advent of the 4IR, the parallel of industrial innovation and human societal development has been a widely contested proposition. In his book, Forces of Production, David Noble explores this phenomenon arguing that the ideology of technological progress according to which technological advancements are made being viewed as “inexplicably beneficial” is founded on an “infantile ideology of technology that obscures the realities of power in society” (Noble, 1984:351). Noble argues that technologies constitute only another channel through which power and control are imposed. Technologies themselves do not offer much, except the extension of systems already in place, which seek domination and control, but masquerade as progress. Locating his ideas to 4IR, this principle appears to be disguised under political aspirations, future spectacles, and an almost irrational belief in the new innovations, as Birhane (2019) terms it “Techno-evangelism” that often neglects critical social issues in their representation of it and its benefits.

Technologies can enter societies through commercial channels, as such, what my study did was explored the technological changes occurring at banks through a critical lens of the utility of such changes in addressing a socio-economic issue such as financial inclusion. This would be useful for further critical understanding of the role and effects of 4IR and technologies within the development project. As the writers I engaged with in this review unanimously state, the concept of 4IR is in many ways still a rhetorical, abstract idea that does not critically consider the reality particularly in developing or global south contexts. I aim to deconstruct that rhetoric through this study and explore whether the promises of 4IR are realisable, for development stakeholders such as policy makers, development practitioners, and most importantly people who are to be beneficiaries of such efforts.

Chapter 3

Methodology

3.1 Qualitative approach

The research aimed to explore the ways emerging 4IR technologies are being introduced, utilized and shaping the banking sector- in the socio-economic context of South Africa. As such, a qualitative approach was selected as it would enable me to discover the meanings, motivators, and ideas that are behind this so called "revolution" as well its effects. Qualitative methods in research are employed to acquire answers about the experiences, meanings, and perspectives of participants as detailed accounts (Mason,2002; Maxwell,2005). Therefore, this approach was best suited to respond to the objectives of my research.

3.1.1 The Case Study Method

The research was organised in the form of instrumental case studies of two banks in South Africa. A case study is an up-close and in-depth study of a particular person, thing, or phenomenon that aims to develop as detailed an understanding of a selected case(s) as possible. Furthermore, an instrumental case study is used to understand the wider phenomenon which the case(s) may illustrate. Given that the primary subjects of my study were separate banks, the case study method was an appropriate way to organise the research and provide the necessary unique insight for each bank. The findings from each case study were used to gain insight into banking digitization strategies in the context of South Africa. Within each case study, as per the convention of this method, a variety of data was collected through various means, and from various sources in order to preserve the wholeness of each case.

3.2 Sampling

3.2.1 Bank Sampling

From prior interest in the topic, and some desktop research, a few banks that were active in the use of digital services and platforms in South Africa were identified and two were selected due to the limited scope of this mini dissertation. These were Standard Bank and TymeBank. This was purposive sampling and is a common method used in social science research when the researcher has certain characteristics they are looking for in their participants. Thus, as the characteristic of interest was 'Banks operating a digital platform in the context of South Africa', purposive sampling was as a well-suited method to select relevant banks for study. The two banks selected, from an assessment of news headlines, public discourse, were active participants in the digitization of financial services in South Africa. Standard Bank is a more traditional long existing bank, and Tymebank, an emergent digital bank. The difference was not significant in selection but would still offer insight into how different types of banks are responding and utilising digital technologies.

3.2.2 Interview Participant Sampling

Within each case study, primary data was collected through in-depth interviews with employees of the two banks. The interview participants were selected based on the criterion that they had a comprehensive understanding of the technological operations and digital undertaking of the bank. Therefore, project managers, business analysts, chief technology officers, software developers, data scientists were well suited candidates who met the specific requirements of the study. Tymebank ambassadors also emerged as important participants to this bank's specific model and were also approached. This was also purposive sampling, that would select participants that were informed to speak to the research question. Participants were sourced through informal networks and referrals. I secured six interviews, three from each bank.

3.3 Data Collection

3.3.1 Semi-Structured In-Depth Interviews

I conducted semi structured in-depth interviews with participants in each of the two banks. In-depth interviews allow participants the opportunity to communicate their responses in as necessary detail as needed (Mason,2002). Data collection in this process is facilitated as a purposeful conversation. It allows for knowledge generation regarding the ways in which the research phenomena are constructed through a thorough recount and discussion. Qualitative semi-structured in depth interviewing usually operates in the understanding that knowledge is constructed rather than straightforwardly excavated. The role of the researcher in this instance is to guide the conversation through probes, follow ups and ensuring the objective of the research remains central whilst allowing the participant room to answer comprehensively to a topic.

Three interview participants were selected from each of the banks in the study, of which each participated in an hour-long semi structured in-depth interview. The participants' profiles are outlined at the start of each case study in the findings chapters below. Whilst there is usually not a strict interview schedule to follow for this method, I used a semi-structured interview guide to offer a general direction for the interviews.[3] The interview guide was also adjusted accordingly as participants had different backgrounds not only in their bank affiliation but as well as their job posting, therefore the probes and follow-ups included in the guide would need to be relevant to each specific participant.

The interviews were facilitated over video conferencing. This was primarily due to the COVID-19 Pandemic lockdown and the national requirements of social distancing. However, regardless of these constraints, it was still an effective method of data collection. It was easier and cheaper than physically visiting the participants who were all in Johannesburg, whilst I was in Cape Town. Video conferencing maintained not only the auditory nature of the interviewing process but allowed for visual contact. The chosen platform for the interviews was Zoom. I specifically opted for Zoom due to its popularity during the pandemic as a reliable

3 Appendix 2

and stable video conferencing platform, it was easily accessible, and all my participants were already familiar with it as they were working from home and using it regularly. In some instances, where severe connectivity issues with Zoom were experienced, a backup platform -Google Hangouts- was used. This only occurred once. It did not cause a disruption to the patterns in which I was carrying out my interviews. All participants were working from home and seemed to prefer after 5pm for their interviews. This was also beneficial as participants seemed to be comfortable in their home space and could easily sustain a detailed conversation throughout the hour-long interview. However, some challenges experienced included network stability for both the participants and I as there were lags and sometimes the call would freeze. Lighting and camera quality was also a challenge as visuals were dark and grainy which often made it hard to read facial expressions, or other visible body cues which may have been important for more comprehensive understanding of what participants were communicating.

3.3.2 Desk Top Research: Documentary Data

Additional to the primary data and particularly because the subject of my study were companies, I also carried out a documentary analysis. This included considering press releases, mission statements and regulatory documents. Documents and other written records produced by the companies aided in highlighting the narratives, trajectories, and discourses emerging from the idea of the 4IR and digitization in their contexts. However, I had to be critical of the information from documentary sources, keeping in mind it may have been produced for marketing or to appeal to investors. These sources were still useful as they outlined how digitisation was being adopted, implemented, marketed, and sold, thus the ramifications of this could be attained in these sources as well. A case study often employs more methods of data collection and analysis than one, therefore this was an important appendage to ensure the holistic aim of my study. I also collected information provided by third party and external companies on the topic. This included consultancy assessments, and news articles, and press releases from Trade Unions. This was useful for further analysis particularly in responding to the second and third points of inquiry (2. Effect on society, 3. External environment). This also offered additional information which I could not gather from the interviews such as performance -related statistics. It would have been particularly useful to gain other documentary data from the interview participants, such as memos or other company documents however I could not be granted access to any as per company policy.

3.4 Ethics

As per the convention of acceptable Social Sciences research, it was important to consider and observe ethical protocol throughout my own research. To ensure the protection of my interview participants, they were anonymised and assigned basic pseudonyms such as SBP1 i.e., Standard Bank Participant 1, or TBP2 i.e., TymeBank Participant 2. Additionally, generic job titles were used without extra specification. I also respected any company confidentiality or proprietary policy, as all documents utilised for study were already in the public domain, and information from interview participants was voluntarily given. Prior to starting the research, a consent and information sheet was provided that laid out the purpose of the study and ethical observations to be followed.[4] The sheet informed participants of the affirmation of confidentiality and anonymity and assured participants did not have to answer a question they were not comfortable with.

3.5 Data Analysis

3.5.1 Thematic Analysis

After data was collected, I organised and interpreted it using the thematic analysis method for each case study. Thematic analysis is an approach that is concerned with capturing and interpreting meaning through identifying patterns, or trends in the data collected (Spencer et al,2014). In carrying out this type of analysis, my priority was to identify topics and issues that were relevant and recurrent across my dataset, organize, and interpret them for meaning according to the research objectives. My approach was particularly inductive as I allowed themes to be progressively conceptualised as I went through my analysis process, guided by Braun and Clark's 6 stage approach to thematic analysis, as follows:

4 Appendix 1

1. I began by familiarising myself with the collected data, as I transcribed and read through my transcripts. Transcription of the audio recordings of the interviews were conducted through a software named TEMI, and manually edited in Microsoft Word.
2. Thereafter, I generated my initial codes, assigning relevant data extracts to codes that described the underlying meaning and inferences to be gained from extracts. In my coding process, I also introduced data and extracts from my secondary sources.
3. Once the coding process was complete, I grouped similar codes and patterns into clusters, where they were truncated to form specific themes. I utilized the Microsoft Excel package to sort and categorize the data. Microsoft Excel's sort and group feature allowed me to group my custom codes and themes and sort them into my preferred order to make them clearer as I analysed.
4. I then did a review once the data was transferred to my Microsoft Excel Spreadsheets and removed or merged certain themes as appropriate to generate a robust thematic analysis.
5. At this point my themes were also appropriately named and the bounding was finalised
6. Once this process was complete, I wrote the reports.

This process was performed twice separately for each case study with its own set of data and presented as its own case study.

3.6 Data Validity and Reliability

Validity and reliability were important considerations as measures of credibility for the consistency (reliability) and accuracy (validity) of my study. Whilst the feasibility of such measurements is easier in a quantitative design where statistical reliability of findings can be objectively calculated, this process is slightly more abstract in the case of qualitative research such as this study. However, Patton (2002) argues that measurements of validity and reliability remain important to consider in qualitative research, to ensure the research to be worth an inquiry, and ultimately trustworthy. For such considerations, I implemented several processes, such as triangulation, pilot interviews and following up with participants. Patton states “triangulation strengthens a study by combining methods. This can mean using several kinds of methods or data,” (Patton, 2002: 247). As such, additional to the interviews, the annual reports and financial statements and other documentation relevant to the banks were important. This strengthened the reliability and in turn validity of my data as the information was collected and verifiable from multiple sources.

I also facilitated 2 pilot studies prior to beginning my research. This was important to note any concerns, or challenges particularly with my mode of research through video conferencing- any shortfalls and potentials risks could be detected before carrying out the rest of the interviews. The pilot studies were not included in the rest of the research as they did not work at the banks that were sampled in the study. My notes from the pilot study guided how I further conducted my interviews as I went along.

Lastly, I did check ins with my interview participants to ensure that I interpreted them correctly in my analysis, leaving room for addition and/or correction.

3.7 Limitations

A limitation for my study was that I was only able to secure a modest sampling pool for interview participants. Due to the Covid-19 Pandemic and stay at home orders, participants could only be gathered through informal networks or contacted online. Many people who I approached for study, would sometimes not return emails, or messages. Therefore, to meet the timeline of my research, my interview participants could not go beyond six.

A further limitation was that participants could only speak localised to their specific departments, or positions. Whilst I tried to attain a diverse set of people in terms of their position in the banks, organisations are often complex and interconnected networks of different people and departments. It may have produced more insightful results if I had been able to explore the organisational structure more, with more participants or even in person visits to the site headquarters. Hence, the wider reading and secondary sources were particularly important. The semi-structured in-depth interviews were important so I could attain data that was as detailed as possible.

Chapter 4

Findings

This chapter and the one that follows, presents the case studies for each bank unitarily, I start with Standard Bank and follow with TymeBank (Chapter 5). Congruent with some of the arguments presented in the literature review, I demonstrate through my findings that technological changes do not occur in a vacuum and pay special attention to the social impacts of technology that emerged in my research. The key themes I unpack include threats to employment, digital inequalities, and the extensions of power and injustice that technologies present. With relations to my research question, I argue that the fourth industrial revolution -or its benefits- are not convincingly presentable as a solution for social challenges such as financial Inclusion. Underlying this argument is that the adoption of technologies and digital strategies can and must also be understood as a social process. This suggests that digitisation is not isolated to the usage of certain tools or technologies but is also facilitated by existing social structures and may result in the creation of new inequalities. This may not always be to the benefit of financially excluded peoples, or the interests of sustainable development. Instead, my findings allude that business interests ultimately take priority in shaping such processes, however, compounded by the narratives surrounding digital technologies- which are often optimistic for increased efficiencies, and reduced costs- largely ignores the adverse effects of digitisation.

The Standard Bank Case study highlighted organisational 'changes' occurring due to digitisation. It painted a picture of disruption that resulted in tensions in employment structures, the branch closures catalysed by digitisation and new avenues of inequality in ways customers were served.

The TymeBank case study highlighted more technical issues with specific technologies and digitisation, this included the use of biometrics and cloud computing.

Both case studies underlined the lacklustre infrastructural environment to support an equitable deployment of 4IR in South Africa for social good such as financial inclusion. Regulatory capacities also emerged as a notable concern in both studies. Whilst the analysis indeed identified the usage of sophisticated technologies, and an interest from the banks in them- a more critical reading as applied highlights the social shape such technologies are taking. As Caruso argues technologies, and their use “are not exogenous to social structures, but they are embedded in social power relationships” (2017:2).

Case Study 1: STANDARD BANK

4.1 Introduction

In 2019, Standard Bank closed 91 of its branches around the country citing consumer movement towards digital platforms as the motivator behind this decision. The CEO of the bank Sim Tshabalala was quoted to have supported the move, stating that companies “cannot, and should not resist technological progress” (“Standard Bank on Closing Branches”, 2020). What is not given due consideration, however, is how such progress often comes at a cost.

In this case study, I present a technical assessment to show the proactive position Standard Bank has assumed in regard to technologies, I then discuss beyond the technologies some of the social impacts observed such as branch closures, changes in employment structures, and digital inequalities which are fundamentally motivated more by business interests than they are social justice. Finally, I discuss the technological ecosystem and lacklustre regulation.

I conclude in this case that as companies like Standard Bank embrace emerging technologies, the motivators for this are not strongly linked to people centred development, and instead appear to be guided by capitalist interests- profit accumulation, cost saving or supposed increased efficiencies for the bank. This is an important point for development stakeholders to be aware of as the ‘4IR’ emerges into public discourse.

The table below introduces the participants who were interviewed and their role, as well as the literary sources used for this study.

Participant Profile	Role
SBP1	Business Analyst
SBP2	Data Scientist
SBP3	Research & Development Specialist
Literary Sources	
SBAR_*Year_pg*	Standard Bank Group Annual Report
SBRS_*Year_pg*	Standard Bank Group Report to Society
SBSAAR_Year_pg	Standard Bank South Africa Annual Report
SBSARS_Year_pg	Standard Bank South Africa Report to Society

Table 1 Standard Bank Sources,

For full citation please see References

4.2 The Technologies

The research departed from an assessment of the technical changes occurring at Standard Bank. From the onset, the bank displayed a prima facie investment in the use of technology in delivering their services. On a visitation to their website, a prompt to download a banking application on my mobile phone catches my eye, followed by the option to sign into a web-based online banking platform. A deeper look into their annual reports as published on their website further reinstates an optimistic position towards the use and implementation of new technology. The first acknowledgement of a drastic technologically disruptive moment that I could find in their annual reports, dates to 2013 –having searched up until 2010-, which proposed the opportunity of leveraging prospective technology in their operations, as "faster and more reliable" (SBAR_2013_20).[5] This was also the first report that made acknowledgement to a 'revolution', using vocabularies such as "new", "quantum leap" and other phrases popular within the discourse.

[5] Before 2010 would have preceded the time in which 4IR has generally emerged.

When asked about the tools and technologies they interacted with, the interview participants mentioned specific technologies such as machine learning, artificial intelligence, data analytics/ sciences, blockchain, cloud storage and robotics –of which many have been argued as hallmarks of the fourth industrial revolution. The technologies used varied across their job function for example, SBP2 as a data scientist had more practical interaction with data analytics, and machine learning,

"We use machine learning, artificial intelligence…deep learning, big data, store data on the cloud in my day-to-day work" SBP2_163.

This was also echoed in the bank's annual reports which stated they were using machine learning and artificial intelligence for efficiency (SBSAAR_2019_11).

SBP3, as a researcher, was more concerned with their future applicability,

"We look at emerging types of technologies… AI, blockchain, robotics and the like to see how they can be of use to the bank in five years' time or so" SBP3_66

Interview participants also reported instances of current adoption at the time of the interview, suggesting the newness of certain tools and technologies in the bank. SBP1, a business analyst, demonstrated this in the instance recorded below regarding machine learning. Not only is it newly implemented into their team, but also requires them to learn new skills to use it.

"We had a meeting yesterday when my boss was like, okay guys, you have two weeks to learn how to use machine learning to solve problems." SBP1_226

For the bank, the increased capacities of technologies as they develop, offered new possibilities as technologies can do more, see more and be used for more. This was illustrated by SBP2, who discussed how new modes of analysis using data driven technologies such as machine learning, and data sciences, not only allowed them entrance into insights they previously did not have access to but opened their opportunity and capacity to respond to more queries from the business managers and executives. They stated,

"We can work with data, it could be customer data, client data, internal bank data, and we can apply various data science models" SBP2_70.

The movement towards digitisation also featured front-end technologies which have direct interactions with customers and clients. This included digital wallets, or instant money, which allow users to store and send money through their phone numbers. They also provide financial services through supplementary mobile application and internet banking platforms- such as MyMo or Snapscan.[6] These front-end developments are said to be targeted mainly at improving customer experience utilising technologies in software development and engineering but are also supported by back-end infrastructures that enable, as well as develop their efficiency and effectiveness over time (SBRS_2019_13). They have also shown prospective interest in integrating technologies towards the structural automation of their operations, citing the transfer of 6.3 million savings, investment, personal and business accounts to the new digital platform and discontinuation of current legacy systems[7] (SBAR_2015_40).

Coetzee (2018) argues technologies will dramatically change the way banks operate, over the next decade, particularly in how they service and enable consumers to engage with their banking. Through emerging technologies, namely data analytics, artificial intelligence, banks such as Standard Bank are moving towards capitalising on the integrated use of digital technologies. This is to say, as my findings lead me to agree, Standard Bank is indeed increasingly moving towards digitisation and the use of financial technology. However, the extent of this as indicative of a 4IR and more significantly its benefits, in this context remains debatable. For starters, whilst currently operative, legacy systems are in a process of decommissioning as per the 'new digital disruption', this has led to key concerns which are more social, and thus present the challenges of digitisation in this context. These challenges are explored in the following section.

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6 MyMo is a low-cost transactional account that is opened digitally. Snapscan is an online mobile payments platform that enables users to facilitate transactions through scanning Quick Response (QR) codes with their phone cameras, that are assigned to a particular merchant, including shops, restaurants as well as purchasing basic services such as electricity.

7 Legacy systems are old methods, technologies, and computer systems that may be outdated but are still in use as they support current key functionalities.

4.3 The Social Shape of Technologies

Audrin (2019) notes, digitisation can be conceptualised as both a technological phenomenon and an organisational change. Whilst as shown above, there are examples of technologies being used in the bank's operations, this is not a standalone phenomenon. As global narratives and trends move towards technological progress, they often propose mainly positive effects. In financial services, public and private institutions, banks, and literature anticipate productivity gains resulting from the application of the new wave of technologies (Mhlanga, 2020; Musgrave 2019). This is often backed with threats of extinction or failing should banks not catch on to these proposals (Ohene-Afoakwa & Nyanhongo, 2018,). These narratives however tend to ignore critical social impacts that arise from the application of technologies in the sector. Through viewing technological changes and outcomes through a critical social and political lens, we begin to see more of how these technologies manifest in society and more significantly the negative outcomes they may directly or indirectly cause.

For this case study, three such processes were identified including (1) branch closures in favour of digital banking systems, (2) impacts on work and workers and (3) Goals for profit accumulation in digitisation strategies. What this section highlights are the role of business- capitalist interests- and the extent to which they are the main motivating factor for adopting digital strategies. Thus, the current dynamics of power in society i.e., the interests of capital over the interests of labour, or profits over true equality guide the manner in which technologies are disseminated and used.

4.3.1 Branch Closures

Possibly, the most visible social process indicating technological adoption at Standard Bank was the closure of physical branches in lieu of digital systems. The most definitive year for this change was 2019 which cut down the bank's branches by 104.The bank stated that the South African franchise had experienced:

"...economic weakness, subdued consumer spending and credit demand, low business confidence and intense competition, compounded by higher unemployment reducing the number of bankable clients." (SBAR_2019_41)

They argued that keeping branches open was a waste of resources, therefore “cutting costs” significantly influenced their migration towards digital platforms. For the bank, digitisation allows them to save money on overheads such as salaries and rent on physical brick and mortar branches, as this would mean they no longer need as many employees, or rental space. According to their financial annual statements within the last decade, for operating costs as it pertains to banking activities, there have been several cuts and changes.

Item/Year	2020	2019	2018	2017	2016	2015	Average excl.2019 &2020
Premise	3.17%	3.6%	6.7%	6.9%	6.8%	6.9%	6.8%
Staff Costs	54.4%	55.5%	56.0%	55.0%	55.0%	54.3%	55.0%
IT Expenditure	14.9%	12.01%	10.6%	10.5%	10.4%	11.2%	10.6%

Table 2: Standard Bank Item costs displayed as a percentage of yearly banking expenditure.[8]

Numbers were sourced as presented in various annual reports. Please see reference lists for full citation

This was particularly visible in their premise costs which accounted for a previous average of 6.8% of the total expenditure, however, was cut down to 3.6% in the year 2019- the same year of the branch closures. Whilst staff cuts were also made in 2019, the change in expenditure was not as dramatic. This was unaccounted for in the data and at the time of research, may have been too soon to report on. The expenditure in IT related costs, averaged at 10.6% from 2010-2018, but experienced a 2% increase in 2019 where it accounted for 12.01% of their expenditure.

8 The column for 2020 shows similar trends as identified in 2019, however, due to COVID-19 regulations many physical banking services were suspended, the effects of which is not fully accounted for in this column.

However, whilst the argument of cost saving is made by the bank to justify digitisation, costs are often accounted for in other ways, for example through employee salaries -in the immediate instance.

"It (automation) saves money for the bank! In the sense that they don't have to pay salaries…" SBP1_389

The participant places emphasis on "bank", which is an important consideration for whose costs are saved. This necessitates a more nuanced understanding of how power relations are reconstituted to the favour of capitalist interests through digitisation strategies. Ultimately "cost-saving" means the banks interests in keeping costs low whilst recovering profits take priority over the disadvantage of workers- particularly the working class- who are made precarious and economically vulnerable as they are pushed out. This particular effect is discussed more in the following section.

4.3.2 Innovate or Die.

As the bank restructures internally to accommodate a more digital approach, the impacts and changes to labour have been a prominent concern surrounding the 4IR and digitisation in general. The bank states their position that they are not opposed to new technologies but are aware of the requirements of change that technology demands from their workforce.

"While we are certainly not blind to downsides of progress, we are not luddites about technological change." (SBAR_2019_14).

Whilst the creation of new roles and positions was recorded, simultaneously, some roles become redundant and thus results in the loss of employment for those whose jobs have become and are becoming automated as the bank sees their upkeep as costly or a "waste of resources". The efforts towards creation of new skills or jobs have been focused mainly on those that can be used in the digitisation process for example in 2015, the bank recorded higher headcount in innovation and digital banking specialist areas (SBSAAR_2015_19). SBP2 describes the changes they experienced with their current role being new and having evolved since they joined the team. They report the formation of a new data sciences team in their department.

"This is a new role for me but also in my team- I am one of the few people that do data sciences…I know for sure there was no designated team…data science team more than 5 years ago" -SBP2_93

Additionally, for employees, acquiring the skills that are used in digitisation carries capital as it maintains job security for those who can undertake the newly created positions. Employees within this space are viewed as 'drivers of a changing culture', and more innovative or relevant. SBP2 recognises their skills as a data scientist for example as vital in the new operations of the bank, and how after training they were able to change the culture of how people in their team previously worked.

"I have one of the skills or a few of the skills that are identified to be essential in the 4IR….I'm driving that ability or changing the culture of how people work or getting more people to want to do that type of work that I do rather than what they are doing currently, so I think yeah I am glad to be a part of it as well" SBP2_473

However, the creation of new jobs due to digitisation does not curb the effects of the threat and risk automation has on other existing jobs- particularly those that can now be automated. SBP1 speaks about how as they work towards digitisation and are pushed to innovate to maintain their job and relevance in the bank, it comes at the cost of other people's jobs.

"Um, people are afraid to lose their jobs… jobs are scarce if it gets to a point where it's like, listen, adapt or leave, which obviously still pushes out people who don't do tech jobs but.."

Employees performing non-technical tasks are becoming increasingly precarious as technologies show ability to take over. Schlogl and Sumner (2020) write that in developing countries -such as South Africa-, low and medium skilled workers are facing the most competition from automation. SBP3 in the research team at Standard Bank speaks to this effect,

"AI will probably take over the 'more repetitive jobs'" SBP3_378.

*"*Repetitive jobs" would refer to workers who would ordinarily support in person client interface which ranges from, tellers down to even security guards at branches. This transcends "competition" with technology to a more ominous restructuring of work and labour systems- particularly for low-skilled workers. Following the worker cut of 1001-1200

employees announced by Standard Bank in 2019, in the annual report for that year, this was recorded as a ‘misstep’ or ‘unintended consequence’ (SBAR_2019_14). Whilst the bank offered retraining and up skilling programmes, for workers this came at the demand of a change in skills, capacities and even worker identity to fit in with new digital systems.

“Within a space of three months you’re being asked to reinvent yourself literally your role is changing” SBP3_367

“I think the point of unemployment is actually under…underemphasized because people really do not want to lose their jobs. So, they go through great lengths…just to learn technologies, to stay relevant, to stay in their jobs, to keep their jobs. Um, I've seen older people (workers) refuse to sit down. They're just like, Nope, I'm gonna learn this technology, take me through it” SBP1_531

Where workers are unable to meet such demands, or compete in this environment, they lose their job or become less valuable to the system.

“It’s a case of innovate or die… I actually get graded on that. You know? How have you innovated; your bonus is determined by how much you innovated” SBP1_518

In the Transformation report for 2019, the bank notes that fewer than 100 employees were formally retrenched, however 920 opted for ‘voluntary retrenchment’. The conditions that led to their retrenchments as voluntary are not defined, but this suggests the dangers of “upskilling” programs, and shocks to worker identity as a result of digitisation which SBP3 referred to (SBSATR_2019_37). Whilst the bank states they aim to “ do everything [we] can to ensure that our employees have the skills they need to remain relevant as our industry digitises”, such figures may tell a different outcome (SBSAAR_2019_11)

The table below of data from their annual reports shows how the organisation structure is shifting towards the reduction of employees. The table below shows the number of permanent and staff and branches of the bank throughout the years, some figures marked ‘n/a’ could not be found the general trend however has been reduction in permanent staff, as well branches.

Year	2020	2019	2018	2017	2016	2015	2010
Permanent Staff	29581	30 102	32 162	32876	n/a	35652	53351
Branches	213	528	n/a	n/a	n/a	703	705

Table 3, Standard Bank Permanent Staff and Branches over Time,[9]

The reduction in employees has been met with criticism from SASBO- The Finance Union, in South Africa, which is concerned about such threats to jobs. Eugene Ebersohn, the Assistant General Secretary responsible for the Standard Bank portfolio, states serious concern given the country's high unemployment rate, arguing that job losses based on operational requirements to banks will "inadvertently suppress the sustainability and growth of the economy" ("4IR Humanity Needed",2019:3). Plainly stated, this is in itself counterproductive for achieving social justice goals such as poverty reduction or financial inclusion, as Hlatshwayo (2017;2019) has contended, this is a critical issue for unions and labour organisations to focus on and illustrates the imbalance of power between capitalist interests and those of the working class. Low-skilled workers are at the highest risk of impact, as such effects of digitisation strategies by banks stands to widen the skills gap and wealth gap barring meaningful economic reintegration as the digital economy pushes them out.

General Secretary Zwelinzima Vavi of the South African Federation of Trade Unions states that

"The fact that Standard Bank sees the digitizing of their branches to be in line with 4th Industrial Revolution is communicating a message to workers that Industrial Revolution is a threat not a programme to up-skill and empower," (Khumalo,2019).

Interestingly though, what I found was that the current advocacy of SASBO focused more on harm reduction through measures such as up skilling or total retraining of workers for other careers. For example, the SASBO newsletter for the fourth quarter of 2019

[9] Permanent Staff numbers show the Standard Bank Group regional numbers for Africa, country specific data could sometimes not be found due to inconsistencies in their annual reports, the general trend however is a decline in numbers corroborated with recorded job losses and branch closures. The dramatic decrease in 2020 could not be accounted for amidst the uncertainty of the COVID-19 pandemic and permanency of the bank's reactions.

highlighted the need to "Prioritise 4IR approach relevant to South Africa… as other countries such as Germany and Russia have done" ("Why SASBO is Challenging…", 2019:6). The union also reported that they had joined the South African Presidential commission on 4IR as means of fostering collaboration. In an earlier issue for 2019, Ebersohn mentioned their focus on initiatives such as 'business in a box' for sacked employees who voluntarily accept the package, to have tools to start their own businesses. He states whilst "never in favour of retrenchments, once the technological evolution becomes a reality, the focus shifts towards cushioning the impact of such on jobs" ("4IR Humanity Needed",2019: 3). The Unions response in this manner was important to note as it suggests to me the seemingly inevitable loom of technological change, and perhaps the challenges to civil society in such respects as Hlatshwayo (2017;2019) has cautioned in the manufacturing sector. Shoki (2019) argues that Unions have lost strength and militancy within the current pro-business, neo-liberal administration. In September 2019, SASBO had planned to lead -supported by COSATU- the Congress of South African Trade Unions, what would have been the largest bank strike since 1920, in protest to the job losses due to digitisation (Makamase, 2020). The demand from SASBO however, was for the union to be included in engagements with the banks in representation of employees affected by digitisation, to allow time and provision for "alternatives to retrenchments plus up-skilling, re-skilling and out-skilling programmes." (Why SASBO is Challenging…, 2019: 3). The strike was interdicted by the Johannesburg Labour court after being accused of not following proper procedures. SASBO argued that this was a delaying tactic that showed how the interests of workers were being ignored and not considered.

Whilst critique on the pacified position of unions to the issue of employment loss and threats to workers due to "4IR" has emerged, as Shoki (2019) and Hlatshwayo (2017) contend, the dynamic shows how technologies and digitisation strategies translate as extensions of power and how 4IR and its global representations are enabled at the expense of human workers.[10] A point can thus be made about the misplaced metaphor used in the quote

[10] Hlatshwayo (2017) argues that unions have tended to focus on traditional issues, such as politics from above" or wage negotiations, whilst there has been a negligence of reaction to the issue of technological introduction in working environments. He writes, unions often adopt a "rearguard" response to deal with the aftereffects of technological introduction rather than an immediate reaction to protect jobs. In the context of this study, the demand by SASBO to be included in engagements by the bank, or aid upskilling efforts is example of this critique and shows shortfall in their organizing and robust response around issues of technological innovation. As showed, whilst only 100 employees

earlier[11] which references the luddites, who were a band of English workers in the early 1800s who destroyed machinery in the textiles industry, which they believed was threatening their jobs[12]. It is ill-fitting that the bank executives who are at the position of power in this instance would make this comparison, when the actual victims are workers. Furthermore, the defaulting to and efficacy of "retraining and up skilling solutions" to employment threats should be wearily questioned, especially in the context of South Africa, where already existing high employment is linked to more complex challenges, in education, poverty and policy shortfalls (Oyedemi &Choung, 2020). In such regard, the effects of technologies on jobs/ organisations are a critical consideration for the outcome of digitisation. Whilst allowing for lower human capital may decrease costs, it comes as a threat to employment, which should be undesirable- particularly in the environment of high and increasing unemployment (Research ICT Africa: 2020). Consequently, it makes no logical sense that this would result in financial inclusion or active financial participation, as it indirectly contributes to the loss of jobs and income. Compounded with already existing disadvantages in access to education, technologies, and infrastructures this would likely not be a small or frictional issue as the discourse would propose, and suggests, as has been warned, the 4IR threatens to widen the income inequality gap in the country. For workers who lost jobs due to this, SASBO has described their management as inhumane and insensitive ("4IR Humanity Needed", 2019:1).

The justifying factor of these changes typically leads to arguments of cost saving. Thus, branch closures, or lay-offs, are deemed justifiable. However, this is an example of how, as Caruso (2017:3) notes "cost saving" arguments for digitisation only consider positive externalities and ignores negative ones. For my research in this case study, the cost of implications for branch closures outside of the bank itself go largely ignored, this includes the costs incurred by workers who lose their jobs in an environment of already increasing unemployment, and in the wider scheme the economy as SASBO warns. Valenduc and Vredamin (2016) argue that the saving of costs and productivity gains are only visible for large

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were formally retrenched, 920 were "voluntarily retrenched" suggesting that majority of workers did not take to the upskilling programs which were supposedly part of the union's representation efforts.

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12 Taylor D. (1988) The Luddites. In: Mastering Economic and Social History.Macmillan Master Series. Palgrave, London.

firms investing in ICT, yet these investments only determine micro-economic effects as their gains come at the expense of lower income people and workers.

4.3.3 Getting the Largest Piece of the Pie/Market

Additional to cost-saving, the bank also argues that technology increases its competitiveness in the industry, thus has become a key tool for them to maintain industry leadership. From my findings, 'competitiveness' could be understood in two ways, the first being market shares, and the second being the reputation and prestige carried by the usage of technologies. These two conceptualisations of competition are closely related as acquiring a good reputation would also draw in the part of the market which is interested in and has access to digital platforms, which would accrue the bank profits.

"They pretty much want to remain in the forefront of the industry. Our CEO calls it getting the largest piece of the pie so the other driving force for adopting technology is to, you know capture more market-share when they come up with requirements which technology must be able to address," SBP1_180

"I think it's competition, and now you've got start-ups who are focusing on smaller parts and doing it very well with new technologies coming out, they get things done much easier, so I think for us it was because we needed to explore and mostly remain competitive" SBP3

Notably, however, is that this competitiveness or capture of a market share is not necessarily achieved through acquiring the highest number of clients but is assessed through client income bases which offer higher chances of profit accumulation. This casts a shadow for the prospects of underbanked and unbanked clients whose needs are eclipsed by competitive gains afforded by digital strategies. The resounding danger is that business interests pursue what they always have in the history of capitalism which may result in exclusion and adverse effects particularly to disadvantaged people. The motivations for technological advancement do not necessarily show the prioritisation of equitable inclusion, instead, neo-liberal principles such as profit accumulation and competitiveness.

The next section explores some of the socio-economic impacts to customers to be expected in digitisation.

4.4 The Unequal Voice of Customer

As with any business the customer plays a vital role in its operations and decision making. Within the context of digitisation of financial services, the bank argues that customers are also driving forward this need, thus it is their responsibility to respond *(SBAR_2015_52).*

"Existing Customers are getting more aware- when they see what other people's banks are doing, they may wonder why their bank isn't doing that" SBP2_225.

The bank fears that as the industry develops on a digital trajectory, they are at risk of losing their clients to their competition should they not also capitalise on that. For instance, SBP2 states,

"we'll have FNB allowing people to open a bank account with a selfie, and then Discovery coming in with like a virtual card, or a virtual bank that you don't even have to go to branches anymore….so similar things happen where we want our clients to be able to open an account with a selfie or things like that" SBP2_220.

Customers are more attracted to banks that are using more sophisticated technologies as they are viewed as more relevant, and trendy.

"It (use of technologies) adds to our reputation and how people see us" SBP2_240.

The bank notes that as the "undisputed competitive advantage" of digitising is recognised across the financial services industry, to fall behind or not make use of that would leave them at risk of "clients leaving" (SBAR_2019_14). The bank supports this claim, citing that 99% of transactions by volume in 2019 took place online (SBAR_2019_14).

However, the contention of customer centricity is that there is often a disparity between which customers are heard and therefore prioritised which raises concerns for the emergence of inequalities in service. Whilst the findings report that the voice of the customer is important towards Standard Bank's digital strategy, it is not always a unanimous voice that is heard. Although the South African market is diverse, there is a stark distinction between the consumers that largely runs along class lines.

SBP2 describes this as 'two parts' to the market.

"The South African market is…. quite diverse, but there's also two parts. The affluent and the not so affluent" SBP2_249

In this regard, the decisions of the bank are mainly influenced by higher end customers who offer more profitability, thus are at a better advantage to receive more tailored products and services driven by technology. Moreover, from the 5 largest banks in South Africa, Standard Bank currently has the largest income base- meaning they service majority higher income earners in the country, (BusinessTech,2019).

"It's mostly the high-end consumers that are going to drive…the decisions that are made in the bank based on their behaviour" SBP2_260

Furthermore, high-end consumers are also more likely to prefer digital banking services, as well as have easier access to them.

"I think it depends on the type of clients and customers you're talking about so if you're looking at your more affluent clients like in Sandton... the more affluent clients that are always on the go, yes they'll use digital platforms" SBP1_363

Interview participants reported that on the other hand, lower income client segments appeared less likely to utilise digital banking platforms and thus faced the risk of banking exclusion as Standard Bank digitises. SBP2 states

"We have met the needs of many of the consumers who don't use branches anymore, but also there's that other part of consumers that got affected adversely".

Furthermore, branch closures -which were justified by the move towards digitisation-, occurred mostly in the rural and township areas[13] although studies have shown many people in those areas still rely on traditional branch-based banking due to reasons such as poor digital infrastructures, or digital illiteracy (Mlitwa &Tshetsha, 2012; Pankomera & Greunen,2018). As Mlitwa & Tshetsha (2012:369) note, banks often utilise customer centricity, and claim products are targeted to mainstream markets, yet it is questionable whether the low income, remote and rural population is included in this category. Mlitwa and Tshetsha's study focused

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on mobile banking in rural South Africa, yet their concern remained valid in the context of my study. Customer inequalities highlight the adverse disruptive impacts of digitisation which poor people bear the burden for in ways such as increased travel time to access services when branches closer to them are closed, or not having access to the devices and resources needed to keep up with bank decisions to digitise. CEO Sim Tshabalala however states that companies cannot do anything about that ("Standard Bank on closing branches", 2020). He states

"...some people argued that we had a duty to keep empty branches open to preserve jobs. When challenged in this way, I often replied by asking my interlocutors when they had last visited a branch. Most people suddenly looked a bit embarrassed and said, 'years ago.'"

One would wonder however, how representative of the majority those he engaged with would be. He further contends

"Businesses can do almost nothing about labour market structure, or transport costs, or migration regulations"

For the question of this research, perspectives and attitudes such as these, highlight new avenues through which exclusion manifests. SBP2 shared a personal recount of their usage of the bank branches, stating that it has been a long time since they have used it, although the branches closest to them -in a metropolitan centre- remained open.

"We know the drama that was there last year, when the people were complaining about branch closing and all that. But at the same time… I do not remember the last time I specifically walked into a branch… But also, I'm someone who lives in the urban metro area- I live in Johannesburg, the branches close to me didn't even get closed. But there is in rural areas where those are the people that need the branches the most are some of the areas the branches got closed and people now have to travel even further to get to a branch so they can do their normal day to day banking. So, it's things like that, I think there's a fine line between are we being driven by our consumers' behaviour...? I think of which consumers are driving the behaviour" SBP2_258

This suggests that not all customers are created for or treated equal, and the needs of lower income clients are at risk of being overlooked within this particular model of digitisation. Some of the interviews cited that this was due to an oversight or blanket approach in the market research that supported the argument that 'customer behaviour drove the need for digitisation'.

"… they probably interviewed people living in cities and they are like okay I haven't been to a branch in two years, so I don't need it, so we have met many of those consumers needs but there's definitely other parts of consumers that got affected adversely." SBP2_261

Ultimately, lower income client segments are more vulnerable to the adverse effects of digitisation, as banks make the trade-offs between costs and profits.

"…but I think there was a strictly business aspect to it too, branches cost a lot of money for rent and all of that so it's just reducing cost, and it could be like we're going more virtual but at the same time we know the benefit is reducing costs that comes with rent and all of things, so yeah." SBP2_297

4.4.1 Customer Centred vs People Centred Strategies

The utility and capacity of technology or digital banking to service lower income margins is also unclear. The bank states its belief that IT can be used to overcome service delivery for people living remote areas SBAR_2019_21. However, how this was to be achieved was more difficult to understand. Interview participants reported that from the bank's standpoint, the profitability of doing so was low, compared to the costs.

"Um I don't think digital services can be directed to service lower income brackets. From a profitability standpoint no I don't think so, given that they don't bring in that much when we look at the bottom line, their contribution is miniscule compared to, you know, the upper the more affluent clients" SBP1_415

How this leaves the disadvantaged and underbanked population is compounded by the state of industrialisation in South Africa in general; particularly in rural and township areas where internet access and stable electricity for instance which is critical for digitisation remains very low, due to infrastructural shortfalls or expense related reasons.

"If finding money to buy bread is an issue what's going to make people look for money to buy data to go online- so I think by virtue of going online digital you are unconsciously or

consciously excluding people, yeah so I don't think the bank -or banks- are going (to) make the effort" SBP1_416

Furthermore, there was inconsistency in the development of technology, resulting in actual inclusion on the ground. For example, whilst older technologies such as USSD were not a popular option because they were outdated, sophisticated technologies such as apps and internet banking have not yet changed the developmental outcomes- such as achieving *full* financial inclusion to disadvantaged peoples.

"I haven't used ussd in donkey years, generally South Africa has moved past that technology, but it also hasn't." SBP1_423

Coetzee (2019) though argues that app functionality is not to be seen as competing with technologies such as USSD, rather complementing it, particularly in its utility in servicing people living in rural areas. Though, in this instance, findings suggested its looming discontinuation, in lieu of more recent approaches. However, even if such is not the case, it still does not address the core reasons for financial exclusion particularly in the historical context of the primarily disadvantaged demographics. The duality of South Africa's socio-economic circumstances results in a multitude of outcomes of digitisation. For some this may be further exclusion. For example, the cashless nature of digitisation reduces the transactions of smaller and more cash amounts such as donations and cash tips, which widens the scope of exclusion to many informal businesses and traders who often prefer cash, (Demigurc-kunt & Klapper, 2012). Fatoki (2016) found that the main ICTs used by female traders in South Africa was the mobile phone, however barriers of high cost, and lack of skills were primary obstacles for extended use of ICTs in this demographic. The provision or usage of more sophisticated tools and technologies would not be a convincing solution for exclusion in this case. Fatoki highlights socio-economic ills which are separate to technological changes or developments.

Whilst certainly, digitally driven products that aim at creating entry points into the banking system for excluded people exist, they still require a bank account in most cases, thus still harbours the challenges and barriers of access (SBAR_2017_60).

"We have digital wallet and instant money and all of that but it's not the same model as other African countries, because you still need a bank account to use it but that model (that does

not need an account as used in other African countries) specifically didn't work in South Africa." SBP2_291

Whilst the bank's reports are furnished with activities towards corporate social responsibility and financial inclusion, interview participants noted that in practice this was a much more difficult task that still involved a lot of unaddressed challenges. For example, smartphone penetration would need to be high in order to accommodate the types of software and technology being used. About 10.4% of South African households have access to the Internet at home of which 17.3% were in metropolitan areas whilst only 1.7% were rural households. Access using mobile devices was 60.1% nationally. Currently, only about one third of the country's population is reported to have access to a smart phone (O'Dea, 2020). Feature phones remain more popular in the country, as they are cheaper to purchase and often easier to maintain, however sometimes experience compatibility issues with applications more geared for smartphones. Overall mobile phone usage is reported at 45% in rural areas, 67.5% in metropolitan and 63.7% in urban areas (General Household survey, 2019). This hinders access to digital products and services in many ways and reflects multiple challenges asides from the access to a bank account or even a phone itself. This leaves a significant amount of people at risk of exclusion and the utility of 4IR/digitisation banking in addressing social challenges, questionably incomplete. It also implicates the presumption of equal linear diffusion of technologies, which is not the case in developing countries such as South Africa. Technologies are distributed at different levels across wide variety of factors, such as geographic area, racial and class demographics, hence the digital divide could replicate. The bottom line, however, was that profitability and monetisation still outweigh the space for such considerations. The drive towards commercialisation of product and increases in profit margins, and competitiveness would appear to have the higher bargaining power.

"People who are much more driven towards the commercial side as important would ask how much money can you make out of this, and they often win at the end" SBP3_316, states in response to how the experiences of excluded people can be included in decision making processes.

The findings suggest that there is a distinction between customers, through which the threat of digital inequality could translate. A customer centred approach is not always a people centred one, of which the latter would consider the contextual issues which people face. This includes but is not limited to costs of travel if branches close, levels of digital skills, trust in digital models, and as basic access to smartphones and devices. Thus, whilst digitisation follows consumer behaviours and patterns, it leaves the question of which consumers are listened to, catered to, and seen in this process. The findings indicate that this is skewed towards the banks more affluent clients who also are not as negatively impacted by changes, whilst lower income and working-class client segments who are also the main components of the underbanked and unbanked population in the country remain unserved and may even be at risk for potentially more and deeper exclusion. The emerging reality -that this study also reaches- is that the outcomes of digitisation are as a consequence of the trajectories that organisations take. The actors behind such trajectories are often removed from local realities or needs.

4.5 Adaptation/Inevitability

Despite the social considerations discussed above, the bank has embraced the digital transformation as per the global trend, and there is a sense of inevitability to not only the technical changes, but also the social effects of such. Digital business models offer efficiency and convenience, to the banks, and whilst this may not be to an equitable end, it still appears the preferred approach for them to work towards. SBP3 reflects on the inevitability of digitisation and its effects.

"It [Digitisation along with effects like loss of jobs and exclusion] is going to happen to be honest," SBP3_378.

SBP1 echoes this with a simple statement.

it's [continued digitisation] sort of inevitable, SBP1_396.

Such sentiments ring familiar to the CEO's statement that companies cannot and should not reject technological progress whilst simultaneously noting that the country is nowhere near ready for the type of change and impact offered by a 4IR. This leaves the concern that such high intensity shifts towards technologies whilst more efficient, and faster to banks, potentially leave their proposed benefits such as convenience as privilege that excludes people who may not have access or the resources it necessitates and those adversely affected through job losses. This actually creates new realms of exclusion whilst the solutions proposed are irrelevant to the issues currently resulting in financial exclusion.

"The digital platform economy's rise heralds a new era of efficiencies for those willing to participate." – Rod Pole, Group Head of Change and Business Transformation, SBG

The key word 'willing' in this statement by Mr. Pole neglects the realities unpacked in this section of analysis, which are that digitisation strategies operate in an environment of inequality, where they pose as new avenues of exclusion, particularly to poor people, or precarious workers.

4.6 External/Regulatory

The final inquiry of the study considered the surrounding environment in which the bank is digitising. This looked to find any other external influences or effects to how digitisation is occurring, such as wider government regulation. The findings present infrastructural challenges as barriers to digitisation and to the users. I also address the unprepared regulatory environment, which hinders innovators but more significantly limits protection mechanisms of consumers, people and social structures. With the dangers of business interests and technologies outlined above, protection mechanisms would be important to ensure that the unanticipated consequences of technologies such as unemployment and the digital divide are controlled.

4.6.1 Technological ecosystem

The findings in this theme echoed significant infrastructural challenges such as internet connectivity and electricity stability, which would not only affect consumers, but as well as the banks digital capacities themselves.

"Network is a challenge! you need data, we have such a terrible network I think that's an internet providers problem but yasis man that is the one frustrating thing" SBP1_451

"It's very tough to build those digital products when you know there's no foundation- basic access to internet, data," SBP1_463

A technological ecosystem would be formed by key players such as the banks themselves, internet service providers, governments and regulators and healthy competitive arena. Locally, such infrastructures, still remain a challenge that also opens up wider risks for example, SBP1 explains regarding the risks associated with cloud computing,

"in certain instances it makes sense, in others it doesn't, let me use an example of banks going to the cloud- um there's a lot of caveats or there are a lot of risks involved, so a lot of people are like, we are moving to the cloud because you won't be using a lot of physical brick and mortar space but , you can easily be held at ransom because your data doesn't sit where you are- as we use international servers so this actually poses risks." SBP1_294

Data is not stored in the country increasing the risk of ransom, and further implications of foreign tech companies holding access to data of people in South Africa- this is more fleshed out in the second case. Critics such as Kwet (2019) have discussed how this goes further to risk of a new digital colonialism, when technological needs are outsourced to western companies abroad. The gains of technological productivity are also exported to these companies who provide such infrastructures whilst local ones are unable to support the sector.

4.6.2 Regulation

Adequately competent policy and regulation of technology particularly within the financial services sector is still significantly lacking, and may not be as effective in ensuring equitable, inclusive, and supportive technological policies.

*"It's cool and all but they have so many things we need to fix, like government services and how government views innovation and the regulation around all these new technologies that are there, because you know where regulation is will inform how quickly some of these technologies are adopted" SBP*3_475.

Technologists still must build credibility of the utility of their products, particularly in financial services which has influence on the general developmental direction of the country.

Finance is such an integral part of society you can't build a whole bunch of systems in a garage and expect a whole country to use it, or for people to rely in it because things go bad and we've seen that these techies don't necessarily get it, there's so much that you know can actually go wrong. SBP3_533

In South Africa the clearest and most active regulations of digitisation in the financial services industry is the Protection of Personal Information Act also known as POPIA. As the title suggests this mainly handles the protection of customer data. Participants highlighted the importance of adhering to confidentiality and data ethics provisions within the act as one of the more significant regulations to their work. However financial technology regulation in South Africa is still relatively -or at best- vague. Standard Bank is classified as an accountable institution as per the Financial Intelligence Centre Act 38 of 2001, thus is still held accountable -digital or not- to the provisions in the Act regarding illicit flows of money through money laundering or corruption. However, fintech companies, of which can be outsourced by the Bank do not meet the definition of an accountable institution thus are exempt from such legal jurisdictions and regulations. Additionally, telecommunications and mobile phone operators are also not identified as FICA accountable institutions. The consequence of this is that transactions occurring within this space remain unregulated. Only as recently as June 2020, were proposed amendments to the Act that would require crypto-asset service providers referred to as CASPs to register with FICA compliancy. This would regulate the use, trade, and activities of crypto currency businesses as accountable FICA institutions. Overall, whilst regulators are aware, and have identified the importance of robust social engagement in this space, the response to the on-going changes and shifts in regulation has been slow. Although in 2019 the South African Reserve Bank released a media statement stating its move to join the Global Financial Innovation Network, as part of the initiative towards further understanding and adaptation of financial innovation to the benefit of all South Africans (SARB,2019)

4.7 Conclusion

The main arguments emerging from this case are such that, there is digitisation occurring at Standard bank at a technical and organisational level, however, underlined by social processes of which some may have negative effects. This case raised concerns particularly regarding threats to employment as the bank moves towards the digital and closes branches, persisting digital inequalities which translate as customer inequalities to the disadvantage of the poor and marginalised communities and finally, the regulation surrounding the usage and adoption of technologies is still relatively vague in South Africa, leaving a gap in the understanding and implementation of IT solutions in financial services.

Business and neo-liberal interests emerge as significant motivators towards digitisation strategies, to which I raise a critical consideration for the effects of such interests particularly in their developmental propositions.

Chapter 5

Case Study 2: TymeBank

5.1 Introduction

One of South Africa's first digital banks, TymeBank proposes to simplify banking in order to make it accessible. It was chosen for study due to this focus on the financial inclusion needs of the market, "serving the underbanked". Its advertising and launch in 2018 heavily leaned on the idea that it is built around the needs, and empowerment of South Africans. Whilst marketed in this way the approach still holds critical risks that may make it an unsustainable solution for the challenge of financial inclusion. The bank correctly identifies some of the challenges that result in financial exclusion in South Africa, such as the high cost of fees, or difficulties with identity documentation, however the proposed digital solutions held certain caveats.

This case explores the critical issues surrounding the models and technologies that underpin this solution. I begin with a technical assessment of the tools used to create and sustain the digital bank. I thereafter discuss the model and strategy, which places an emphasis on "customer centricity" guided by the challenges that the bank argues underserved and unbanked people face. This leads to a discussion on the proposed solutions and their implications, such as biometric use in place of identity documentation, data collection through Artificial Intelligence models, the use of cloud computing platforms and the hidden costs associated. I finally end with an external environment assessment to which the study reflects low technological penetration and regulation as other challenges faced within this model. Ultimately this case also shows that technologically deterministic solutions to social challenges are privy to significant problems that representations of the 4IR and digitisation often neglect. Whilst the bank models itself as a solution for financial exclusion, it still operates within the boundaries of business- as such overtones of capitalism also shape the effects of technologies, and replicate in their digitisation strategy as well.

Participant Profile

Participant	Role
TBP1	Mobile and Card Payments Subject Matter Expert
TBP2	Senior Developer
TBP3	TymeBank Ambassador
Secondary Sources	
PMG Presentation	Parliamentary Monitoring Group Presentation
ARC	African Rainbow Capital update

Table 4 TymeBank Sources

5.2 The Technologies

Although digital banks existed globally prior to its inception, TymeBank was South Africa's first fully digital bank launched 5 November 2018. It has no physical branches where customers can access services and is facilitated completely digitally. In a presentation to the Parliamentary Monitoring Group in 2019, the bank described itself as similar to technologically driven businesses such as Uber- transport industry- and Airbnb -tourism & accommodation. Interviewees emphasised that the central pillar of the bank was to be as digital as possible, aiming to complete the majority of its operations through various technologies. This is the fundamental principle of a digital bank. To achieve this, interview participants noted the vitality of technology- including emerging technologies such as the internet of things, cloud computing, biometrics, and artificial intelligence.

"Tymebank is a digital bank, which means everything we do has to be somehow automated…its fundamentally digital- there's very little…human contact in the process- except for when we develop of course." (TBP2_68)

"We try to ensure that whatever we do, is not like the traditional bank. So, we'll go first as digital as possible…Make sure or ensure that systems that we designed have little or no

humans or require little or no human intervention for them to actually work. That's number one." TBP1_20

Whilst digitisation is increasingly visible in traditional banking models as well, what makes digital banks different is that the technology is inherently built-in their operations. Digital banks are immediately freed from the requirements and barriers of transferring older legacy systems into more modern automated systems and thus are supposedly more flexible.

"It (digitisation*) does exist in other banking models as a support role. But in this case, it's sort of morphed into the building part of bank… we are starting from scratch. So that's the difference…the fact that you have to build. In the traditional setup, you would actually only work with existing systems. So there's little or no building done, and there's little or no creativity or innovation that comes with existing systems" TBP*1_60.

For instance, whilst in traditional banks, to on-board a new customer would require an extensive compilation of documentation and is still a contact process- prospective customers would need to visit a branch and physically communicate with a consultant to open an account- this process has been digitised at TymeBank using mobile and web applications as well as standalone kiosk stations. The onboarding process takes typically about four minutes and outsources information from third party partners to fully capture the customer.

"For example, the customer onboarding system...in a traditional bank, the customer needs to physically be in a branch, right? Then there needs to be someone in the branch to attend to the customer, capture their details, capture all of this information, what we have done is…we're saying there's no one to capture the customers details, we are providing an interface, interactive interface, for a customer to…use which uses biometric data capture, Machine Learning all that back-end stuff" TBP1_75.

Following from this precedent, the bulk of the bank's products are also accessed digitally, minimising any human intervention needed in delivering services to the customer. One of the most central technologies in use is cloud computing which enables the storage of data, databases, servers, networks and software on the internet (Frankenfield,2020). This is a particularly fundamental technology in Tymebank's model as it minimises the need for physical systems, and in turn branches, allowing them to operate on a fully digital scale through an internet enabled system.

"And most importantly, the most…most important thing is the fact that we are implementing our solutions in the cloud. So, using a lot of cloud computing. That's also something not common in traditional banks" TBP1_107

Additionally, interface with customers is also established digitally, through several channels including:

App & Web – A mobile application that can be downloaded to a customer's smartphone, thus facilitating an entry point into the bank along with a twin web application, where customers can access the bank through a computer or web browser.

Call centre & chatbot- Primarily for customer servicing this enables telephonic conversations with human consultants. The chatbot offers a similar service, however, the response is facilitated through an artificial intelligence software that simulates a conversation through natural language processing (NLP).[14]

Kiosk- TymeBank kiosks offer customers more tangible access points to the bank through a network of physical self-service stations which enable them to perform everyday banking activities such as transferring funds and deposits. It is also possible to open an account through the kiosks which offer Wi-Fi hotspots to download the mobile app, a camera and thumbprint scanner to capture biometric data which can then be linked to accounts. Kiosks are planted across partnered retailing shops- such as Pick and Pay and Boxer.

Retail till points – TymeBank has integrated with participating retailing shops' systems to offer clients an additional entry point into the bank's services. They can withdraw, and deposit money, and other everyday banking services at the tills of the retail stores.

Tymebank POS Devices- The point-of-sale devices by TymeBank are specifically aimed at SMEs, to facilitate electronic and digital payments.

Ambassadors – The final channel, ambassadors facilitate human interaction. Ambassadors are human agents whose primary function is to explain the bank's product and services to customers. As TBP3 explains, they are also helpful in facilitating the digital transition to

14 NLP is a branch of AI that is concerned with how computers and interpret human language.

customers who may previously not have had as much access to digital services below- such as the elderly for instance.

"We are there to help people who need it, to understand our product…like older…people, who may be intimidated by the kiosks or by the…phone or the apps...and the like but mainly everyone." TBP3_72

The 'ambassador' was particularly interesting for me in this model. An 'ambassador' can be defined as a representative of a foreign or external entity who enters a local setting. In the framework of this study, the description of workers as ambassadors well communicated the positionality through which technologies and digitisation can be understood in relation to the local contexts. 'Ambassadors' serve as extensions through which technologically deterministic and capitalist aspirations of technology companies and systems dissimulate the intentions and impacts of their operations. Whilst these agents are utilised to add a 'human touch' to the digital nature of the system, their purpose and function is to advance the interests of technological and capitalist penetration. In particular the word 'ambassador' is reminiscent of the critique of digital colonialism as argued by scholars like Kwet (2019), or Birhane (2020), through the suggestion that digital solutions can be predetermined and "brought down" by external entities -such as banks or companies to the aid of unknowing subjects. Workers who are tasked as ambassadors are often outsourced members of the communities they serve; this misrepresents their function as 'local or communal advocacy' whilst facilitating the consequences of a reductionist technological approach to social challenges. As such even the 'human' aspect for which they exist may appear only illusory.

In addition to the usage of channels such as those discussed above, the findings also showed the usage and significance of older technologies and systems in place to support the digital bank. Interview participants also mentioned innovating over already existing channels to enable a clearer way of reaching their target market.

"We innovate upon existing technology channels. So, for example, we innovate over WhatsApp, we innovate over Facebook. Innovating, over USSD It's… completely customer centric". TBP1_280

TBP2 mentions that these would be channels that people would already be used to, such as social media, emphasising the needs of customers in their model.

"Social media is huge- so we develop keeping in mind the compatibility- people use WhatsApp and Facebook and SMS- so we want to meet them there- where they are already used to it". TBP2_182

In terms of the discourse of the 4IR this was an important point to note because it begins to highlight some of the problems associated with understanding technologies in developing countries through the lens of industrial revolutions or linear progressions of technology. As TBP2 states innovating over existing channels speaks to the challenges people may still face, such as data costs, or digital literacy; older technologies like SMS, USSD and social media do not need as much data and are often relatively simple technologies to use that works on almost all phones.

"USSD is still key, which may be indicative of the challenges people still face." TBP2_157

"Yeah. And obviously we have a basic USSD channel which means with a basic cell phone you would still be able to do your basic banking. Depending on technology adoption we try to keep up with our target audience" TBP1_282.

Whilst the principle underpinning their strategy was to be as digital as possible, this case also placed emphasis on the model and strategy that digitisation was used to achieve. Both older and newer technologies consolidate to support full-scale digital banking, to reach the goal of providing 'accessible' financial services. As Mr Tauriq Keraan, Chief Executive Officer (CEO), stated, Tymebank is in the "business of financial inclusion" using "digital banking as a mechanism" (PMG, 2019). The apt description of their approach as 'business' is an accurate foreshadow of some of the other challenges of this approach, particularly for 'financial inclusion'. The following section critically unpacks some of the technical aspects of this model to highlight its shortfalls and challenges. It also exposes some unintended consequences of the use of certain technologies. Additionally, I note that the fundamental challenges that result in financial exclusion are unanswered whilst being obscured by models predicated on the imagery of technical spectacle that purports to address the *socio- economic* challenge of financial exclusion.

5.3 Customer Centricity

The bank highlights the aim to achieve financial inclusion as a premise for their business presenting themselves as a potential IT based solution.

"[We're] in the business of empowering people and making banking accessible and dignified for customers". (ARCI,2020)

To achieve this, they highlight the importance of customer centricity, that guides them in identifying the key barriers they presume to be the cause of exclusion particularly for lower income or currently underserved people. As TBP2 explains, because the clients they envision to service probably already do not have as much exposure to technology, it prompts them to design products that are more innovative, centralising how a potential customer would need or use a certain product.

"That also means that we're targeting the population that may not have as much exposure to technology but that becomes interesting for us as designers because our end goal…um… our offering is dependent on technology," (TBP2_283)

TBP1 also spoke to this, stating.

"*It is very customer centric. So, everything is driven towards offering a banking solution to the customer, it's driven towards improving what traditional banks do and improving upon it, whilst eliminating human interaction." (TBP1_257)*

The innovations they implement must therefore speak to a particular challenge. Whilst many of the challenges they identified were legitimate, for example, the high cost of banking fees in South Africa, the solutions they proposed, however, were not as convincing, and in some instances could result in undesirable consequences. This highlights the disconnect between technologies and the social environment in which they are to operate. As has been argued in the previous case study, the naïve view of technology as an objective force neglects its social construction and effects. Essentially, as Orlikowski (1992) posits, the construction of technology is dual as both an objective and social happening. Therefore, as some technologies may be used with certain objective anticipated ends in mind, their entanglement with social, political, and economic forces may produce unintended effects which can be negative.

5.3.1 Biometrics, Data Collection and the Rhizomatic nature of surveillance

A key challenge for financial inclusion identified was that document requirements by most traditional banks excluded people who did not have them, for example, proof of address. The onboarding system at Tymebank utilises biometric technology to capture information about the customer, that is compared with third party source data such as credit providers, or databases from Home Affairs to build the customer profile and as a means of identification.

"*There's a lot of biometrics involved- as you might know, we've got the on boarding, where you can take a selfie and be on boarded as a customer."* TBP1_100

Biometrics are the digital measurement and collection of data related to a person's unique physical features, for example, fingerprints or facial recognition. Whilst there may be an apparent advantage for addressing the lack of physical documentation in biometrics there are some caveats that can be raised about the usage of this specific technology. For instance, primary concerns of biometrics can be made in regard to safety often linked to a high risk of security breaches. This holds concern for cybercrime and cybersecurity which ultimately is a risk for trust. Dagada (2013) notes cybercrime in digital banking is already commonplace in South Africa that affects the trustworthiness people find in formal banking. Reliance on biometric data does not account for this risk. However, beyond the concerns for crime, the usage of biometrics also carries understated concern of surveillance, data collection and discriminatory practice which scholars (Abebe et al, 2021; Buolamwini & Gebru, 2018) have sounded alarms on.

In their privacy policy as it relates to the creation of bank profiles, Tymebank notes that users can receive services based on the "type of relationship" they have with the bank.

"The more we know about you (and can verify), the more access (to products and services) we can give you" tymebank.co.za, FAQ What are Bank Profiles

Whilst users can sign up for an account on the web application, they receive a limited service until they visit a kiosk and input their biometric data – A selfie, or photograph of their face and fingerprints- to receive full access. Once captured the data is processed through artificial intelligence and machine learning algorithms to match it with data stored on the Home Affairs National Identity System (HANIS) which retains guardianship over the databases-, after which full access is provided. Demanding more data, though biometrics which are often linked to other bits of information about customers from third party sources and directly linking it to services provided potentially poses as point of ethical contestation. Customers would have to trade very personal networks of information and data to access services. The privacy policy for TymeBank outlines that data is not only collected from networks of sources but is also shared across various domains including organisations involved in their funding arrangements, businesses that work for them, government, and law enforcement. Delueze & Guttari's 1987 'Concept of the Assemblage' recognises hierarchical data gathering systems between different social domains. In that, as the body is under surveillance it is broken apart into a series of data flows, through which organisations can categorise before reapplying in a bid to influence and manage the body.

Whilst the interview participants affirmed that the biometric data is only used for identification purposes, the implications of what Ball (2005) terms the 'rhizomatic nature of surveillance' which it contributes to through the linkages with third-party sources of data was unaccounted for. For me, this not only raises concerns surrounding information security, individual privacy, and data ethics but even further discrimination. Many studies have reported that the training data sets that are used to program the algorithms behind biometrics have been biased and thus produce discriminatory outcomes. Human biases translate through digital channels and affect the accuracy and fairness of biometric/digital measurements. Some studies have shown the impacts of this against darker skin - black people- who are negatively judged through these technologies, or just plainly invisible and are not recognised by the systems (Buolamwini & Gebru, 2018). The major determinants of discrimination in biometric technologies, are race/ethnicity and gender, which primarily disadvantages women. Furthermore, these discrimination patterns found in biometric systemsi.e. against dark-skinned and/or female people- echoes those that are already found in patterns of financial exclusion, thus their empowerment and 'inclusion' through such channels is questionable

Alongside biometrics, the application of Artificial Intelligence/ machine learning, data collecting technologies present concerns of the facilitation of extensions of surveillance and control as the neo-liberal gaze becomes omniscient about human subjects- or customers. An example of where this could be a threat, is as the bank states of 23 million active credit customers in the South Africa, 8 million do not have an extensive track record with credit bureaus, thus would be difficult to vet and essentially be excluded from the ability to take out loans for instance. Their response to this was to create an alternative credit assessment mechanism in partnership with third party data sources where customers purchasing, and payment patterns could be assessed through the collection of data to build an alternative scorecard for customers. This is part of a global trend for using digital footprints for credit scoring. Whilst indeed customers are included in the process, and have access to credit scores, some studies have reported that this method of credit scoring indicates discriminatory outcomes. For example, Berg et al (2019) found that digital footprint credit scoring discriminated against variables in the data such as device operating systems -where IOS users were seen as less likely to default on loans on the presumption that iPhone users were more affluent than Android users. The collection of very sensitive data in this way can produce discriminatory outcomes, which are not accounted for. As companies are able to demand more and more data about users and share across various domains, the effects may reproduce discriminations or biases that already exist.

5.3.2 Costing the Cloud.

Tymebank also states that the traditional banking model was financially inaccessible due to high banking fees, and complex products that exploit customers lack of knowledge (ARCI 2020). Their proposition to address this was to facilitate an entrance point into banking that was as simple as possible through minimal products like banking and savings accounts, and a card. The bank charges the lowest in the market currently, including free account opening, no monthly fees, and competitive interest rates on savings accounts, penalties, minimum deposits or minimum balances.

"There is no discrimination based on income in what we give back to customers." (ARCI,2020)

To make such low cost offers, the bank highlights the importance of maintaining a low-cost base and ensuring its sustainability through digitisation. Traditional banks credit -in part- their migration to digitisation as an opportunity to reduce overhead costs, this was not a problem for TymeBank as they do not need physical branches that would incur such costs anyway and use a very low number of workers. Ultimately as described by TBP1, the bank's concern in keeping costs low directly ties into their ability to provide low-cost services.

"Essentially, digital banks, fintech's and everyone in this space is driven by how least expensive we can deliver banking solutions to people. How can you achieve financial inclusion without um…without necessarily bearing the same cost as your traditional bank? So that's why we try to go as digital as possible." TBP2_415

As a cloud-based solution, TymeBank makes use of AWS- Amazon Web Services- a subsidiary of American company Amazon, which provides on-demand cloud platforms on a pay as you go basis. Reportedly, about 85% of TymeBanks operations are based on this platform[15]. Cloud computing allows the bank to scale their operations digitally, with little need for employees or physical space. This allows them to reduce operational costs, thus as they argue, provide lower cost services.

"It was not just a matter of charging low fees but having a low-cost base to be able to do it sustainably. The cost base was constructed as a low-cost technology stack. TymeBank did not build each building block but wrote pieces of code to connect the building blocks. …partnered with other organisations such as Amazon Web Services (AWS) who were experts in running the technology. Due to the extensive use of software that hosted the banking platform in the cloud, the cost to TymeBank was lower than that of other banks, which needed to invest in maintenance of infrastructure." (PMG,2019)

Whilst high banking fees are a known barrier of financial inclusion in South Africa, the cloud computing solution also carries a lot of caveats and risks. For example, whilst clients may not be paying fees upfront to the bank, the recovery of profits still drives this model, and the economic concern here is that such profits often end up in the hands of the foreign companies who provide such services. Kwet (2019) warns of how giant tech corporations from western countries like the United States are facilitating a new form of colonialism through the infiltration of digital technologies in the global south. Cloud computing facilitates the new 'land grab', as American companies such as Amazon dominate the provision of such services (Kwet, 2019). The implications for this are that users lose control of their own experiences,

15 https://aws.amazon.com/solutions/case-studies/TymeBank-Case-Study/

data and needs as it becomes centralised in the cloud and thus in the hands of Big Tech companies. The dangers of the increased use and reliance on this technology would be the strengthening of foreign multinational corporations and organisations, at the cost of local economies. More recently, Amazon specifically has come under fire in South Africa through its proposal to build a headquarters on historically indigenous land in Cape Town (Wilson & Prinsloo, 2021). This serves as a reminder of the dispossessive nature of foreign companies, and the extensions of neo-colonialism through “technological advancements” and “progress”.

Whilst TymeBank can save costs on employees, and overheads through operating a cloud-based solution, this indirectly restructures employment systems in the economy and as was discussed in the first case study as a prominent concern of 4IR in this context.[16] This would problematize the zero-cost proposition in the usage of this technology, compounded with a low regulatory capacity, and knowledge systems (i.e., local skillsets and infrastructures) the danger of being economically hijacked by international neo-liberal techno aristocrats presents a threat. Multinational Corporations (MNCs) have through technologies such as cloud computing once again, discovered a site of exploitation in global south contexts. Historically, MNCS have been criticised for entering developing countries and exploiting lax regulations, and low labour wages for their own benefits and increased profits. In the mining sector for example, low regulation from government allowed MNC’s to exploit reserves for export, maximising on their profits to little benefits for communities and people affected by such activity (Naidoo, 2013). Similar patterns are witnessed over the digital, where foreign companies such as Amazon, dominate service provision for technologies like cloud computing, yet compromising on the capacities of labour in the countries they enter, and exploiting low regulations. As Kwet argues, the cost saving proposition of cloud computing, reduces the ‘low-cost’ labour MNC’s previously exploited, to ‘zero’, whilst now fully recovering those costs as profits. This is a significant issue that is often ignored in the arguments of using such technologies to the benefit of developing country economies. According to the African Rainbow Capital Investors Update (2020), the bank had 840 people in their headcount, of which only 150 counts for permanent staff- and the remaining 700, are

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outsourced and stationed in the ambassador program. This is a significantly lower number of staff than the average of other banks in the country, which range from 14000 to 50 000.

As with the changes occurring in traditional settings in regard to work and workers, the required skill set for employees in this model would still be more technically inclined. This would need technological competencies such as coding, software development and data sciences, which are relatively scarcely supplied in the local skills market. This once again highlights how digitisation calls for the restructuring of the labour market, whilst Tymebank may be immune from the problems of lay-offs, and staff reductions, they still facilitate a narrowing doorway for future workers, primarily disadvantaging low skill workers. The economic consequences of digitisation are once again undesirable and may potentially result in the conditions that produce financial exclusion- such as low employment opportunities.

5.4 External/Regulatory

Whilst an effort to target the specific market of underbanked members of society is made by Tymebank, there are certain presumptions around access to internet, devices, as well as digital literacy- and trust from the consumers which are not supported by the reality of the circumstances as was established in the earlier case study.

5.4.1 Low Technology Penetration

The widespread socio-economic inequality in South Africa means Tymebank may potentially find itself in a unique position to redefine the class prescription of digital services. The disparities in access to information and communication technology along lines of South Africa's historical socio-economic discrimination against black and minority groups are a significant concern for this bank- particularly because it does not offer a physical alternative. As technology penetration particularly for lower income margins remains low, which affects how much this service can be offered to and accessed by the target market. The interview participants highlighted that the success of a digital bank is directly connected to the technological capacity of where they operate. Given this, areas where technological penetration is limited, in things as basic as the internet, electricity and access to reliable, compatible phones and devices will hinder the efforts and ability of the bank to provide the service to their target market.

"In the rural areas it's a challenge … So, a digital bank is only as good as the technology penetration of wherever it is. If people don't use technology, and people don't have access to it, then they don't have access to a digital bank." TBP2_403

This was visible for example through spatial exclusion which mainly affects those living in rural areas and townships who also form the majority of financially excluded people. Delivering the service to people in those areas becomes impossible or difficult, which severely undermines the potential or effectiveness of digital banking such as Tymebank's offering.

"It's a bit harder, a lot more difficult, because firstly, it's not as economical or lucrative for telecommunication providers to go somewhere sparse where there's not a lot of people. So that always does leave people, particularly in the rural areas at risk." TBP1_298

Therefore, whilst financial inclusion may be identified as crucial in the bank's mission and model, and even if the technology had the capacity to deliver low-cost sustainable banking solutions, its prospects of success remain hindered by external factors reflecting the unequal environment in which they operate. This shows that ultimately even if the capacity to transform the financial inclusion landscape of South Africa existed through digital and innovative banking solutions, there are still barriers in digitisation, which need to be addressed and require deeper social and economic transformation. These are embedded in spatial segregation, and disadvantage in the delivery of necessary fundamentals- as basic as the internet.

Another recurring theme that arose was the low levels of trust from people experienced by the bank due to their digital nature. Participants reported this as a barrier in acquiring new customers, as there still needs to be more understanding and awareness about how digital banking works. This stands as a potential cause of voluntary exclusion, which is not addressed through a solution such as digital banking, and directly touches on concerns of ethics, confidentiality, and cybersecurity as earlier discussed.

Well, I mean, there are challenges, mostly knowing that in Africa we got quite low technology penetration ….and that also directly dictates the trust that people have in technology. So, do you want to open an account with a bank with no face to it? And [in Africa] people have been typically…slower to accepting change, … so yes, the challenge of trust is something we face" TBP1_176

This remains consistent with earlier studies, by Mlitwa and Tshetsha (2012), who in their research on cell phone banking adaptation in rural areas, found low levels of trust and scepticism as reasons for its low adoption. Participants in their study referred to cybercrime for such reasons, digital banks do not remove that fear and could face it even more.

5.4.2 Regulatory

Lastly, as with the case in with a traditional bank and increasing digitisation strategies, respondents at Tymebank also mention the lagging regulatory environment as a challenge in the sector. TBP1 opines that the government was largely unprepared for the integration of new and emerging technologies, such as cloud computing in banks, thus their response has not been "up to speed".

Um obviously regulations, the regulatory environment, regulatory requirement is not…exactly up to par. like the financial sector is very heavily regulated but it's out of date with some of our needs, TBP1_367.

Another example of this was seen through the commencement of the Protection of Personal Information Act (POPIA). As with the case of the traditional bank, the POPI Act was of major consideration in terms of the regulatory environment pertaining to the operations of Tymebank- particularly with the use and processing of biometric data. [17]

"We are the Guinea pigs for that because regulation is not up to speed and can be inhibiting…POPIA is the one we're looking out for now which has some implications for us" TBP1_377

Biometric data, which as discussed earlier, is recognized as special information under Section 3(27) of the POPI Act. The section primarily aims to uphold the right to information privacy as per Section 14 of the South African constitution. According to Mzila (2016), biometric data is recognised in POPIA along with race, ethnicity, health status and sex due to its security vulnerabilities. POPIA is a significant law because as public and private institutions are constantly being disrupted through the adoption of new technologies, there are changes to how personal information is collected, stored and processed. Whilst the debate

17 Processing as Per POPI 1(1) is defined as Any act of using, storing, organizing or modifying personal information.

surrounding privacy and IT is ongoing, for South Africa, POPIA serves as its continuation in the midst of technological advancements that have further raised the urgency for information privacy to be enforced (Kandeh et al, 2018). Alongside POPIA is the Electronic Communications Act of 2002 ECT ACT, which also highlights the need to protect privacy in the context of consumer rights and security when transacting electronically. However, as the participant described POPIA as 'inhibiting', some concerns with this act have been that such an order has the potential to disrupt or even result in the closure of some businesses (Craven & Eloff, 2015). For instance, Craven and Eloff (2015) found the application of biometrics in microlending as utile in the face of increasing regulation prohibiting the withholding of clients' ID documents and bankcards as security for micro lenders. He argued that biometrics were a smaller investment cost for the high risk of lending money. The study concluded that whilst resistance to biometric systems had initially been high due costs, or low perceived value, this had reduced in the companies interviewed and had led to the increase market share of some companies such as Capitec Bank LTD. This study however did not engage with the critical considerations as engaged with in my study on the implications of biometrics to surveillance practice, privacy, or bias and discrimination.

Ultimately, within the banking sector, biometric data is used within the scope of POPIA because it is used to prevent bank fraud activities-thus is acceptable under security exemptions. Kandeh et al. (2018) states that organisations cannot ignore POPIA. Whilst it was written in 2012 its commencement was only announced in July 2020. At the time of the research this was still very early for further probe regarding the strength of the linkages of data systems, and concerns regarding loopholes -for example through the bank's partnerships, participants could not offer much more detail. The Act officially came into effect on the 1st of July 2021 after the information regulator had afforded a year for companies to comply with its provisions. Whilst the enforcement of regulation like POPIA may pose as challenging for corporations and banks it can also be seen as an important step for ensuring protection mechanisms for societies in the era of surveillance that is as complicated, interconnected, and personal as through emerging technologies.

5.5 Conclusion

TymeBank introduces a model of banking that is predicated on technologies. Although using more sophisticated technologies, due to the needs of the socio-economic context in which they operate, the utility of older technologies is testament to the shortfalls of the representations of current digitisation in a developing context. Digitisation of the majority of their services and operations is a central pillar however the benefits of such, when considering the trade-offs, they may require remain unclear. For instance, biometric identification mechanisms would require trade-offs to very personal networks of user data. This would raise complications for user trust with regards to the cybercrime, as well as ethical process surrounding the usage of such data, although there is some actionability to this concern through the commencement of the POPI act. POPIA emerged as an important step forward towards the safeguarding of information privacy which addresses the critical key points to be made for the usage of biometric data and other personal information.

I also in this chapter, discussed the complications of the zero-cost proposition of cloud computing in that, whilst it may enable the bank to offer low-cost services, it operates in a social context where such 'benefits' may not be enough to address the issue of financial inclusion which remains socio-economic rather than technical, or may actually result in further perpetuation of other problems -such as unemployment, or economic hijack by giant foreign tech corporations which provide such platforms. These findings highlight some of the critical short falls of the use of technology in addressing social challenges which are often ignored in deterministic narratives towards the 'potential' of 4IR technologies.

Lastly, the recurrent concerns regarding the state of technological penetration and regulatory capacity were discussed, to which this case study also highlights significant barriers towards any equitable application of digitisation strategies. This considered the spatial inequalities in telecommunications service delivery, which disproportionally affect the already marginalised.

Due to the issues that emerged in this case, I argue that the utility of this model of digitisation for addressing issues such as financial inclusion is also significantly limited.

Chapter 6

Discussion and Conclusion

I aimed through this study to highlight the necessity of a critical and discerning perspective of emerging ICTs particularly in respects to their utility in achieving social development goals such as financial inclusion. I presented two case studies of two South African banks, which both showed an interest in the integration of 4IR technologies in their operations. For example, the utility of artificial intelligence, cloud computing, and data sciences which was present at both banks.

My study proposes that beyond technological changes, the concept of the 4IR can and should also be understood through a critical social lens. Through this, I argue that, for its utility in efforts for financial inclusion, there are many caveats and risks associated with current trends of digitization and banking which may make it an unsustainable solution as hegemonic narratives have proposed. Without the consideration of core socio-economic factors that contribute to financial exclusion, digitisation stands the risk of not only translating the existing systems and dynamics of exclusion but forging new avenues of inequality. In agreement with critiques of technological determinism by writers such as Caruso (2017), Sutherland (2019) or Birhane (2019), my findings demonstrate that technologies are socially shaped, and representations of digitisation and 4IR in this current context may not correspond with actual phenomenon and thus pose as threats of further exclusion. This, deconstructing the rhetoric and buzz of 4IR -particularly for development- into a more practically corresponding understanding of digitisation.

One of the more prominent challenges to digitisation as a solution for financial inclusion is that the basic infrastructural requirements needed to support an inclusive 4IR, have not yet been met, and where they are available, equitable distribution remains a challenge. This is often overlooked in the rhetoric of the transformative potential of 4IR. Specifically for South Africa, challenges of stable and reliable internet access, as well as electricity would hinder digitised service delivery particularly to lower income and disadvantaged places such as - townships and rural areas. Furthermore, the cost to access digital channels of communication remains high for those who live in these areas. According to a study done by Research ICT Africa (2020) only 22.2% of people in rural areas who have access to mobile services use the internet monthly, with a very constrained use of 25-30MB a month. However, according to my findings, the banks studied would either be unwilling or are unable to service those areas if such infrastructure is not readily available. Due to this, digitisation could further increase the margins of exclusion, where banks such as Standard Bank in a bid to cut costs and facilitated by technologies, are closing the branches that could service excluded people and areas. As such the efficacy of digitisation for servicing excluded people who reside in rural areas, or who do not have access to such technologies is limited.

The economic consequences of digitisation particularly as it regards employment also emerged as an undesirable outcome that would inadvertently contribute to causes of financial exclusion- such as the increasing wealth gap. The most common critique of the 4IR that is accepted even by its advocates pertains to its impact on employment and labour structuring. Technology is often used as a "pretext or opportunity to push through industrial restructuring processes motivated primarily by financial profitability through wage/ cost reductions" (Valenduc & Vrendamin, 2016:15). The issue of unemployment, and its effects on the labour market are viewed as collateral or argued to be frictional. This is related to Joseph Schumpeter's theory of creative destruction (1947) in which he describes processes of innovation as simultaneously destructive and creative as new innovations replace outdated ones this resulting in frictional unemployment where workers would endure a natural process of joblessness as they transition into the requirements of the newly created industries and economies. However, Schumpeter's ideas are not very applicable in the context of South Africa. Job creation, as an effect of digitisation in South Africa would be an oversight that would ignore the reality of already high and increasing unemployment in the country- which is a result of more complex challenges stemming from historical remnants of injustice- for example, access to education, etc. Schlogl and Sumner (2020) note for developing countries low skilled work which forms a significant proportion of the labour markets is most at risk and competition from digitisation. SASBO- The Finance union raised some concerns about this, which were ultimately shut down, and even so the demands they made in response could potentially be inadequate. Representations of 4IR and digitisation often overlook negative consequences facing many workers who have lost and may lose jobs due to digitisation strategies, and whose opportunities for future employment are narrowing as well through an increasing skills gap. At both banks, the skills necessary for workers to acquire were also shifting towards more technologically inclined ones, such as coding and data analysis- similar to the argument by Coetzee (2018) which stated that banks were under more pressure to employ staff with the requisite skill sets to enable the banks to remain competitive. Digital skills, such as data analysis are to become mandatory core competency for professionals (Coetzee,2018:7). Whilst the argument that 4IR facilitates the upskilling of workers is often made, the inevitable loss of not only current jobs, but the narrowing doorway for workers to find employment is of critical concern. The fast-moving pace of technology as expressed by interviewees at Standard Bank means they are to constantly learn new skills- such as programming languages to maintain relevance. As the skills requirements become more technologically demanding, this also places concern on the current state of education and accessibility. At Tymebank, they noted that it was already difficult to source people with the relevant skill sets. In such regard, the effects of technologies on jobs/ organisations have to be considered socially, historically and politically shaped in this context, rather than frictional. The greater economic impacts of digitation on employment emerge as a considerable challenge that could potentially widen the income inequality gap in the country.

Another visible reality of digitisation strategies was that the fore fronting by banks and corporations ensured an underlying tone towards capitalist tendencies which development stakeholders should be aware of. The relationship between technologies and neoliberalism is not easily undone. This was particularly visible in the motivations, and some outcomes of digitisation which emerged from the case studies for example the focus on profit accumulation under "cost-saving arguments". Taalbi (2018: 1144) writes that the actors behind technological innovation and its diffusion may not necessarily be those with traditional experience in the sector -i.e., engineering, computer sciences- but rather businesses, "observing market niches and new opportunities" through which a new technological spectacle can be leveraged on. This was observed in the Standard Bank case study through the prioritisation of business' interests when applying certain technologies. Interview participants highlighted the ultimate importance of profit accumulation, decisively stating it was "their job as technology" to only meet business queries. TymeBank refers to its model as being "in the business of financial inclusion", such language alludes to how principles of business interests are also fundamental in this case.

The role of technology companies themselves is also highlighted where they present technologies to banks as efficient, and best for their services, thus profiteering of technological use. More often than not, such companies are based abroad in countries like the United States. In agreement with the argument by Kwet (2019), the role of digital technologies as a new form of digital colonialism from the West is concerning. Particularly as it infiltrates through such sensitive and in some cases personal lines such as the use of biometric technologies, large scale data collection, which is stored and utilised on cloud platforms like Amazon and Microsoft. This comes off as an unfair trade off for access to financial servicing, in which case, I question its sustainability and consequences. Holtgrewe (2014:10) states, the “future appears to be determined by technologically driven trends that converge upon a blueprint designed by the advanced actors of the industry” – namely business interests. This raises a critical consideration for the effects of such interests particularly in the developmental propositions of digitisation. The dangers this would pose is the tendency for neo-liberal interests to trade off meeting the needs of people, with the potential for profit accumulation often with ethical ramifications.

This study highlights forces such neoliberalism through industry competition and profit accumulation, dangerous rhetoric and spectacle of innovation which are misplaced within the developing context, oversights in already existing inequalities as shaping technological evolution in the society. In the context of South Africa, such narratives propose a linear- direct relationship between the evolution of technologies and development. This often foregoes the gap between the exponential growths of technology and the slowed rate at which innovations are adopted -similarly diffused- due to infrastructural incapacities which produce inequalities whilst neglecting the social issues that complicate the usage of technologies. Digital innovation serves to produce results that firms have always pursued in the capitalist status quo – the accumulation of profit, at the cost of reduction of workforce wages and rights under the guise of cost-reduction which mainly benefits companies. At more contextual levels such narratives do not address undertones of colonialism, and adverse effects of globalisation facilitated through emerging technologies particularly in the digital space. Sutherland warns that organisations must maintain a realistic view of digital business models, avoiding an all-consuming focus on novel technologies (Sutherland, 2019). Whilst this alone cannot be the response to the 4IR, there should be a reconsideration of ‘Schwabian’ positions on technological change and focus on the social issues that emerge due to such to avoid further inequalities. Hegemonic representations of the 4IR do not correspond to real phenomena, particularly in the context of developing countries such as South Africa.

In this thesis I have argued that ‘technologies’ or ‘the 4IR’ cannot be viewed as a substitute for robust socio-economic interventions and will not alone address underlying inequalities in societies. Therefore, they must not be misrepresented as solutions to the problems incurred by the existing status quo.

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Appendix 1 Information and Consent Sheet

Interview Consent Form

About the Study:

Fourth Industrial Banking

The Effects of 4IR Innovation on the South African Banking Industry: A case study of Standard Bank and Tyme Bank

The proposed study is an exploratory analysis of the banking industry in South Africa, - in response to the wave of technological change known as the Fourth Industrial Revolution (4IR). It aims to provide an understanding of the foreseeable effects of this on the South African society. The general aim of this proposal is thus to explore the following:

- The implications that digitizing strategies are having on the banking sector in South Africa,
- The digital economy of South Africa as it pertains to the implementation, and usability of increasingly complex technologies in banking
- The foreseeable implications of these digitizing strategies for the various constituencies of clients who are affected and impacted by such types of developments.
- These objectives have been truncated into the research question: ***What are the foreseeable effects of increasing digitization strategies in the banking sector in South Africa?***

Researcher Details:

Name: Celine Intombiyenhle Masheleni

Student Number: MSHCEL001

Degree: MPHIL Development Studies, Sociology Department, UCT

PLEASE READ THROUGH AND COMPLETE THIS SECTION

Thank you for agreeing to be interviewed as part of the above research project. Ethical Procedure at the University of Cape Town requires all participants to declare informed consent to being interviewed and how the information they give will be used. This consent form is necessary to ensure that you understand the purpose of your involvement and agree to the conditions of your participation.

Please read through the information below, and sign at the bottom to indicate your participation.

- The interview will take up to an hour maximum to complete. I do not anticipate there to be any risks associated with your participation in the study however you may stop or withdraw from the interview at any point.
- The interview will be completed via medium of telephone or video conference

- The interview will be recorded, and a transcript produced, however direct quotes, and summaries taken from the transcript and included in academic publications will be anonymised
- The interviewee will be sent the transcript and given the opportunity to correct any information as needed
- The interview and transcript will be analysed by Miss. Celine Masheleni as the researcher
- ***It is emphasised that company intellectual proprietary and confidentiality policy is to be respected under this study, as the participant you are kindly encouraged to take care in your responses to ensure this is not breached.***
- The final study -and any information and data gathered in this interview- will be published in the public domain,

Participant Details:

__ I Understand that my identity will be anonymous

Position/ job title___________________________

Company_______________________

I agree to participate in the interview as per the conditions stipulated above.

Date__________________________________

Appendix 2 Interview Guide

Interview Guide: Participant Role__________________ Organization_______________ Date______________________________ Time________________________ Medium____________________________	NOTES
Rapport and Consent Hi__________________ my name is Celine, I am a master's student from the University of Cape Town, I am doing some research on the impacts and effects of technology termed as innovations of the fourth industrial revolution on the banking industry in South Africa I would like to ask you some questions regarding your work, and opinions on a range of issues. The information you provide in this interview will be used strictly and only for academic purposes of completing my dissertation in fulfilment of my degree program. The interview will take no more than an hour. Before I begin can I confirm that you have received the information sheet with all the information relevant to your participation in the study? *Interviewee Ans:* Do you have any questions regarding that? *Interviewee Ans:* Do you confirm informed consent to participate in this study? *Interviewee Ans:* Great thank you,	
(TRANSITION) To start off, I would like to ask some questions regarding your position in the company and the tools that you work with.	

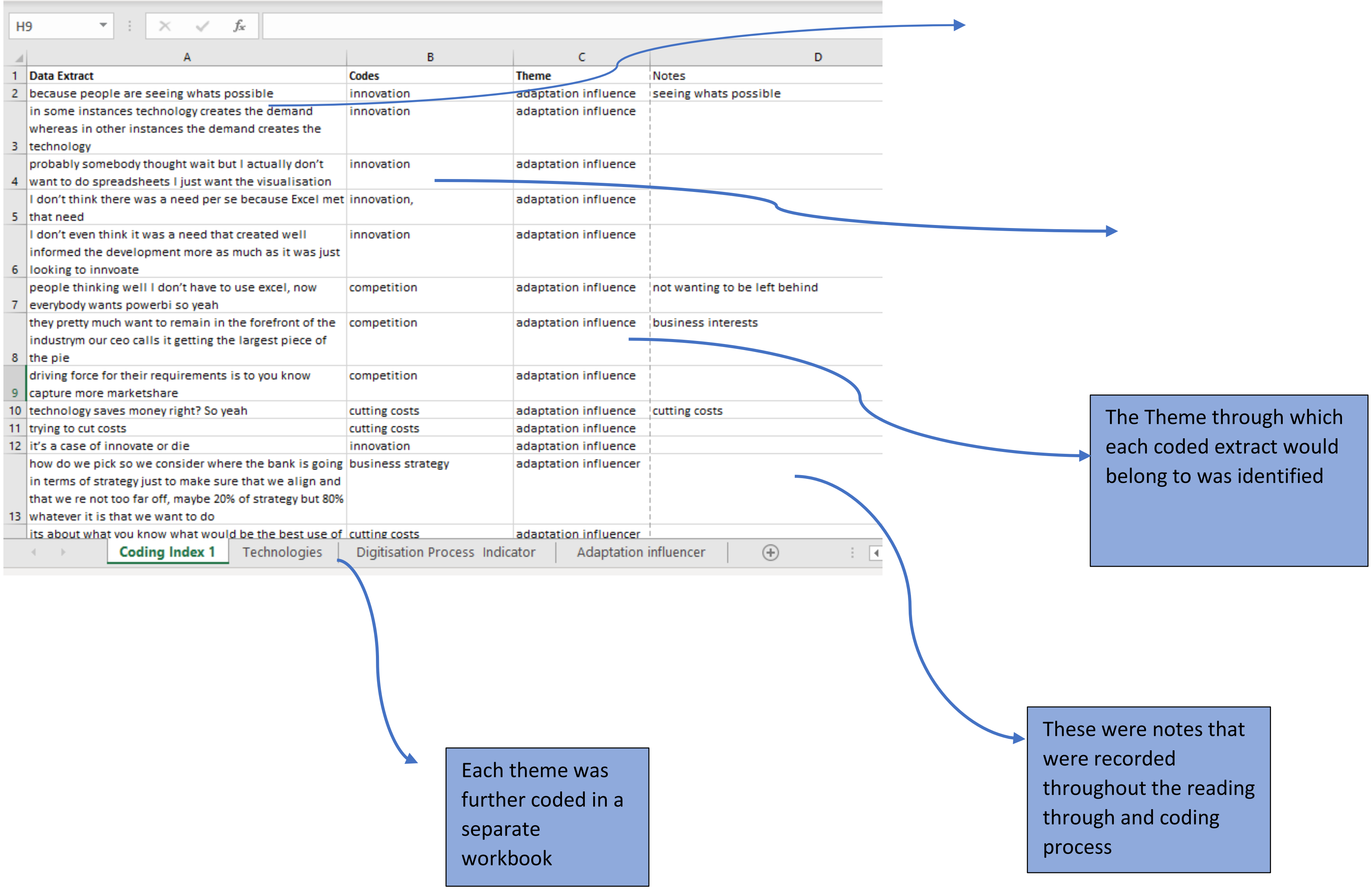
Section 1 Probe Questions: Technology
1. What is your role/position in the company?
 	
2. Can you please explain your role to me?
 	
3. Did this position exist 10/20 years ago?
    a. If so, does it look any different from how it used to and how?
 	
4. Why do you think your role is important to your organization now?
 	
5. Given this is a fairly technical oriented position- can you briefly explain to me what exactly you are responsible for and what tools you use in order to achieve this? ML, AI, UI etc.
    a. How does using these tools or technologies make your job possible or assist?
    b. Do they make it easier or perhaps more difficult?	

(TRANSITION) Great, I now want to ask some questions about the expected impacts and effects of your work on the consumers and clients. This speaks to how what you do translates to the end user of the overall products designed and offered	

Section 2 Probes: Consumer / Client expectations 1. Are there any expectations or behavioral changes expected from clients or consumers? (in order to match with shifting systems as you've described? Are there any expectations?) 2. Or where there any changes in consumer needs and requirements that led to your role being created or necessary? a. What is the profile of the expected user / consumer? i. For example UX/UI graphics designed for accessibility must be simple to use? Patronage 3. How do you consider the context of banking in South Africa as you do your job? a. Does it matter? And if so to what extent? b. What concepts does it bring up or matter? c. Does this conflict with, or enhance your work? 4. Will a more tech driven banking system affect consumers that much? a. To what extent? i. Possible improvements in Customer Service ii. Speed and efficiency iii. Reduce red tape, i.e documentation iv. Access to services? v. Potential exclusion of people vi. Tech savviness /youth population vii.	
TRANSITION: We have discussed technology and we have discussed market and client, in the next section I want to just expand more on how they intersect and nuances of that	
Section 3 Probes: Diffusion of Technology 1. When you design software, or develop technology, do you think you create the demand for those apps and software by creating them, thus requiring people to engage with the technology/ innovation you've created or do you think the process is people create a demand and then it is up to innovators, and companies to meet that demand? a. What direction does the process of innovation go? 2. How are innovations communicated into the society?	

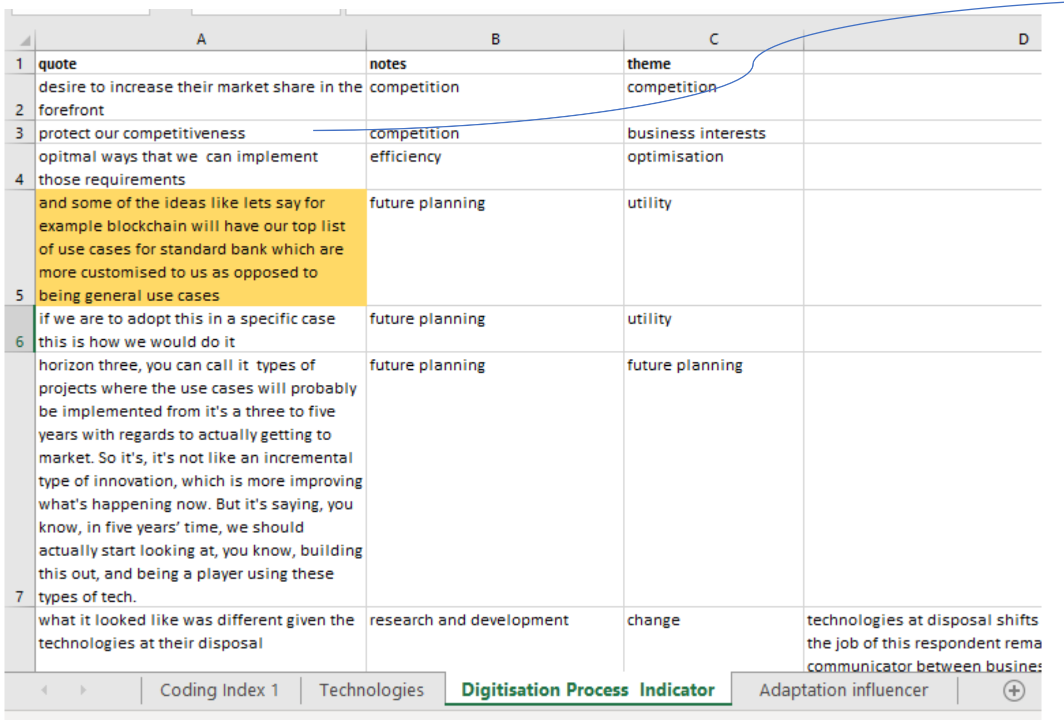
3. What other factors contribute to the adoption of the technologies you use/ mention? Internal and external- bank apps, vs data science predictive analytics for example	
TRANSITION: Finally, I want to ask some questions about the external environment, particularly in the context of South Africa and how they affect your job?	
Section 4 Probes: Environment and Regulation 1. What challenges or advantages do you face in regards to: a. SA Context, b. Tech capacity (internet speed, equipment availability, skilling and upskilling opportunity) c. Regulatory d. Government capacity e. 4IR Rhetoric f. Ethics	
Concluding Remarks Summaries and confirm: Further questions notes: Is there anything else you think would be important for me to know what was not covered today?	
End interview ***Thank You for your participation in todays interview, I appreciate you taking the time to assist me in my research.***	

Appendix 3 Example of Indexing Process



	A	B	C	D
1	**Data Extract**	**Codes**	**Theme**	Notes
2	because people are seeing whats possible	innovation	adaptation influence	seeing whats possible
3	in some instances technology creates the demand whereas in other instances the demand creates the technology	innovation	adaptation influence	
4	probably somebody thought wait but I actually don't want to do spreadsheets I just want the visualisation	innovation	adaptation influence	
5	I don't think there was a need per se because Excel met that need	innovation,	adaptation influence	
6	I don't even think it was a need that created well informed the development more as much as it was just looking to innvoate	innovation	adaptation influence	
7	people thinking well I don't have to use excel, now everybody wants powerbi so yeah	competition	adaptation influence	not wanting to be left behind
8	they pretty much want to remain in the forefront of the industrym our ceo calls it getting the largest piece of the pie	competition	adaptation influence	business interests
9	driving force for their requirements is to you know capture more marketshare	competition	adaptation influence	
10	technology saves money right? So yeah	cutting costs	adaptation influence	cutting costs
11	trying to cut costs	cutting costs	adaptation influence	
12	it's a case of innovate or die	innovation	adaptation influence	
13	how do we pick so we consider where the bank is going in terms of strategy just to make sure that we align and that we re not too far off, maybe 20% of strategy but 80% whatever it is that we want to do	business strategy	adaptation influencer	
	its about what you know what would be the best use of	cutting costs	adaptation influencer	

Appendix 4 Example of Second Level Coding after Indexing



	A	B	C	D
1	quote	notes	theme	
2	desire to increase their market share in the forefront	competition	competition	
3	protect our competitiveness	competition	business interests	
4	opitmal ways that we can implement those requirements	efficiency	optimisation	
5	and some of the ideas like lets say for example blockchain will have our top list of use cases for standard bank which are more customised to us as opposed to being general use cases	future planning	utility	
6	if we are to adopt this in a specific case this is how we would do it	future planning	utility	
7	horizon three, you can call it types of projects where the use cases will probably be implemented from it's a three to five years with regards to actually getting to market. So it's, it's not like an incremental type of innovation, which is more improving what's happening now. But it's saying, you know, in five years' time, we should actually start looking at, you know, building this out, and being a player using these types of tech.	future planning	future planning	
	what it looked like was different given the technologies at their disposal	research and development	change	technologies at disposal shifts the job of this respondent rema communicator between busines

After identifying themes, data was moved to a separate workbook for each theme, were subthemes or further coding was performed. This shows the Theme- Digitisation Processes at Standard Bank, and its accompanying subthemes

Appendix 5- SB closed Branches

Gauteng Alberton, Arcadia, Baramall ,Benmore Gardens , Bloed Street, Bracken City, Brixton,Chilli Lane,Cosmo. Dainfern Square, Daveyton ,East Rand Mall Edenvale, Ellis Park, Florida ,Forest Hill ,Hillcrest Boulevard Pta,Hyde Park ,Industria ,Irene Mall, Johannesburg ,Kempton ,Kwa Thema ,Lambton ,Lyttelton ,Malvern,Melrose Arch , Menlyn , Menlyn Maine ,Mogale BC,MTN , Newtown Junction , Norwood, Palm SpringsParkview , Randburg ,Randfontein , Randridge Mall ,Rivonia, Rosslyn, Sandton (Alice Lane), Soshanguve Crossing, Sunward Park,Unisa ,West End ,Wonderboom Junction , Woodbridge Square	**Mpumalanga** Amersfoort , Evander, Kamaqhekeza, Kwa Guqa, Mbombela, Ogies	**Northern Cape** Britstown, Diamond Pavilion, Hanover, Kenhardt, Kuruman, Philipstown,Sishen, Strydenburg, Sutherland
Free State Bultfontein, Jagersfontein, Kestell, Lindley, Marquard, Phuthaditjhaba **Kwazulu-Natal** Dales Avenue, Hilton, Isipingo, Mandini, Musgrave Road, Theku Plaza, Tugela Ferry, Umkomaas , Watercrest, West Street	**Limpopo** Bochum, Bopedi, Namakgale **North West** Cachet Park Student Bureau, Klerksdorp, Moruleng ,Tower Mall	**Eastern Cape** Alexandria ,Barkly East ,Cala , Linton,Grange ,Molteno , Summerstrand **Western Cape** Belhar, De Rust, Grassy Park Mini, Hout Bay, Melkbosstrand, Mitchell's Plain, Mutual Park,Philippi, Plumstead, Rawsonville, Strand

List of branches closed in 2019, *Mostly* Middle-lower income Areas

Source: *Standard Bank is Closing more than 100 banks,* Here's the Full List Business Insider South